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CONTENTS, MARCH 1953

NUTRITIONAL ASPECTS OF ANTIBIOTICS—*Olaf Mickelsen, Ph.D.* 221

WHAT'S NEW IN FROZEN FOODS?—*Donald K. Tressler, Ph.D.* 230

NONFAT DRY MILK SOLIDS IN FOOD PREPARATION—*Pauline C. Paul, Ph.D., and Pearl Jackson Aldrich, Ph.D.* 234

EFFECT OF PROTEIN SOURCE ON MAINTAINING BLOOD SUGAR LEVELS AFTER BREAKFAST—*Mary C. Coleman, W. W. Tuttle, Ph.D., and Kate Daum, Ph.D.* 239

MOTIVATING PEOPLE TO USE EDUCATIONAL MATERIAL—*Jean M. Leach* 245

PREVENTING DISEASE THROUGH FOOD-SERVICE-PERSONNEL TRAINING—*James Lieberman, D.V.M., M.P.H.* 248

THIAMINE AND RIBOFLAVIN RETENTION IN VEAL—*Elaine Asp, Isabel Noble, Ph.D., and Lucille Gomez* 251

EDITORIAL
Report of the Nominating Committee, The American Dietetic Association, 1952–53 254

CURRENT COMMENT
Are Our Hospital Diets Therapeutic? 258
Literature on Dental Caries—*Nina Simmonds, Sc.D.* 264

WHAT ABOUT TRICHINOSIS? 272

BOOK REVIEWS 274

FOREIGN FLAVOR 276

CURRENT LITERATURE 280

NEWS NOTES 298

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Nutritional Aspects of Antibiotics[1]

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SMALL amounts of antibiotics added to the diet stimulate the growth of certain animals. When that finding was announced, it catalyzed a rapidly moving field into an almost frenzied rate of activity. So much work is now being done on the nutritional aspects of antibiotics that it is nearly impossible to keep abreast of the latest developments. For this reason only a limited review of the work in this field will be attempted. The present report is confined to: (a) the growth-promoting effects seen when various antibiotics and other compounds are added to so-called "complete" animal rations, (b) the vitamin-sparing action of dietary antibiotics, and (c) the nutritional results attributed to supplementing the diets of human beings with antibiotics.[2]

In a sense, the finding that antibiotics have a beneficial effect from the nutritional standpoint was a complete turnabout from the previous thinking on this subject. Earlier work strongly emphasized the growth-inhibitory effect of the bacteriostatic compounds when they were added to purified diets. The addition of small amounts of sulfaguanidine to a diet containing all of the then-known vitamins markedly decreased the growth of young rats. This growth inhibition could be overcome by adding to the diet either liver extract or para-aminobenzoic acid (2). In later work, the rats on the sulfaguanidine diets developed leukopenia, granulocytopenia, anemia, dermatitis, and in some cases hypoprothrombinemia (3, 4). The nutritional deficiencies resulting from the feeding of sulfonamides were clarified when it was shown that the growth of these rats could be restored by a folic acid concentrate (5), the anemia cured with crystalline folic acid (6), the dermatitis cured by means of biotin (4), and the hypoprothrombinemia overcome with vitamin K (3).

GROWTH RESPONSE TO ANTIBIOTICS

Perhaps the first report of a growth-stimulating effect of a bacteriostatic agent was that of Briggs and co-workers (7). Their chicks, raised on a purified diet containing all the known nutrients plus sulfasuxidine, grew better than chicks on the unsupplemented diet. Two years later, the same laboratory (8) reported that streptomycin also stimulated chick growth. At that time, an attempt was made to produce an animal with a sterile gastrointestinal tract in order to obviate the bacterial synthesis of vitamins and/or toxic substances. It was impossible to sterilize the gastrointestinal tract by feeding the bacteriostatic agents. As an incidental observation, it was noted that the addition of 10 mg. streptomycin or 1 gm. sulfasuxidine per 100 gm. ration produced a considerable increase in growth in the chicks.

Little was done on the problem during the ensuing four years because most of the attention in poultry nutrition centered on the animal protein factor, or "APF." After the isolation of vitamin B_{12}, it was found that concentrates of vitamin B_{12}, such as the fermentation residues from the production of antibiotics, produced better growth when added to an all-vegetable ration than could be accounted for on the basis of their vitamin B_{12} content (9).

The attempt to determine the nature of the growth factor in the fermentation residues led to the recognition of aureomycin as a growth promotant. Although most of the antibiotic had been removed from the residual fermentation mash, there was a possibility that the small amounts remaining were responsible for the growth effects. In 1950, Stokstad and Jukes (10) showed that this was so[3] when they reported that the addition of 10 mg. crystalline aureomycin to 100 gm. of their all-plant ration supplemented with adequate amounts of vitamin B_{12} stimulated chick

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[1] Presented at the 35th Annual Meeting of The American Dietetic Association in Minneapolis, on October 21, 1952.

[2] The role of antibiotics in chick nutrition has been reviewed by Briggs (1).

[3] Even previous to this, Harned *et al.* in 1948 (11), while studying the pharmacology of aureomycin, found that the addition of 250 mg. of the antibiotic to 100 gm. of their chick ration produced greater weight gains than the basal ration.

growth almost to the same extent as the fermentation residue.

The magnitude of the growth response due to antibiotics varies from experiment to experiment. For example, Heywang (12) found that antibiotics produce growth increases in chicks ranging from 0 to 8 per cent. At the other extreme, Berg and associates (13) obtained weight increases ranging up to 21 per cent when an aureomycin concentrate was added to the ration of broilers.

The growth-stimulating effect of antibiotics is not limited to chicks. Turkey poults show even more pronounced and consistent growth with antibiotic-supplemented diets (14–17). Turkeys receiving antibiotics in their ration attained a weight as much as 35 per cent more than the unsupplemented controls (15). Average weight increases of aureomycin-supplemented poults ranging from 20 to 27 per cent over the controls have been seen in both hens and toms (18). This antibiotic growth response occurs both on all-vegetable rations and on rations fortified with 15 per cent animal protein (19).

Jukes and associates (20) and Luecke and coworkers (21) reported simultaneously the growth-stimulating effect of antibiotics for swine. The latter investigators found that when 0.05 per cent streptomycin was added to the ration of weanling pigs, the rate of weight gain was 1.48 lb. per day while control animals gained 0.98 lb. Other workers have also observed growth improvement in pigs following the supplementation of their rations (22–26).[4]

Calves, too, respond with increased growth when small amounts of antibiotics are added to their ration. The stimulatory effect is, however, limited to the first twenty weeks of life (28–30), the antibiotics apparently having no effect after the flora in the rumen becomes established.

In dogs, aureomycin added to a purified diet containing 20 per cent casein increased the growth rate (31). However, the growth stimulation was no greater than that following the addition of vitamin B_{12}.

Rats on a ration containing all the known nutrients at adequate levels have responded to aureomycin or terramycin with increased growth (32, 33). In these cases, the rats on the basal rations were not gaining weight at an optimal rate. Although the antibiotics increased the daily weight gain, it did not always bring the rate up to the gains reported by others using a purified ration (34).

In mice, the effect of aureomycin was inversely proportional to the nutritional quality of the diet. There was no growth stimulation when 5 mg. aureomycin were added to a well-balanced casein-sucrose-fat ration properly supplemented with vitamins and minerals. When the same concentration of aureomycin was added to an all-plant ration, the weight gains were improved but they were still only two-thirds that obtained on the casein ration (35).

When terramycin was the supplement with a commercial-type ration, no growth response occurred in rabbits (36). Lambs also showed no growth improvement when low levels of antibiotics were fed (37), and there was a weight loss at higher levels (38).

ACTIVITY OF VARIOUS ANTIBIOTICS

The growth-promoting action of antibiotics is a variable effect. The variability holds true both for the different antibiotics and for different levels of the same antibiotic in the same species. Whitehill and co-workers (39) found that although the addition of aureomycin, penicillin, and streptomycin stimulated the growth of chicks, chloromycetin did not. This effect and possibly a growth inhibition was observed by Branion and Hill (19) when chloromycetin was added to the ration of poults. In another case, aureomycin, penicillin, terramycin, and bacitracin produced equally great growth stimulation in chicks while streptomycin was relatively ineffective (40). Similar results have been reported by Davis and Briggs (17).

Not only do poults show a variable growth response when different antibiotics are added to their rations, but the same antibiotic incorporated in the diet at a number of levels sometimes produces weight gains that show no relation to the level of antibiotic (41).

In a number of cases, antibiotics added to practical chick rations have had no growth-stimulating effect. Davis and Briggs (17) made that observation early in their studies. The most extensive work along this line has been that of Coates and associates in England (42). In their study, chicks from the same hatch were sent to two laboratories. The same commercial chick starter mash was used by both groups. In the laboratory where chicks had been raised for many years, penicillin supplements produced a significantly greater increase in weight than did the basal diet. However, in the other laboratory where chicks had not been reared previously, penicillin had no effect. The chicks in the latter laboratory, however, gained weight at the same rate as the penicillin-supplemented birds in the first laboratory.

The absence of a growth response to antibiotics in chicks living in new quarters has been confirmed (43, 44). However, the antibiotics did produce some effect in the new environment after the third week, although the lack of growth stimulation in a new chick room may persist for six months or more when excellent sanitary conditions are maintained (45).

When disease-free pigs were raised under excellent sanitary conditions, aureomycin was ineffective in stimulating growth (46).

The inactivity of antibiotics in animals raised either in an environment where no other animals

[4] The effectiveness of different antibiotics in stimulating the growth of swine has been reviewed by Wallace *et al.* (27).

have been kept or where the hygienic conditions are adequate has led some workers to explain the growth-promoting action of antibiotics on the basis of reduction in the "disease level" (42, 47). According to this concept, the animals which respond to antibiotics were infected with an organism(s) capable of reducing the rate of weight gain and decreasing the utilization of food for body weight gains. No other manifestations of an infection are apparent in these animals. The causative organisms presumably are difficult to destroy in animal quarters that have been used for a long time, but the antibiotics suppress the organism causing the poor growth, which in turn allows or stimulates the growth of the animals.

When different antibiotics are combined in a ration, the growth-stimulatory effect is not additive. Mixtures of aureomycin and streptomycin or penicillin and bacitracin produced no better chick growth than did either substance alone (16, 48). In fact, a combination of penicillin and streptomycin added to the ration of swine adversely affected the growth and general welfare (49). However, when the antibiotics were added separately, they both stimulated growth and produced healthy pigs.

EFFECTS OF DIETARY ANTIBIOTICS ON FEED UTILIZATION

The efficiency with which animals convert feed into body weight when antibiotics are added to the ration has been investigated by many workers. Although a number of studies showed no (12, 13) or an inconsistent (17, 50) reduction in the feed required to produce a unit gain in body weight, several workers have found improved feed utilization with antibiotic supplementation.

In one study (51), aureomycin added to a chick ration improved feed utilization in every case. Another study (52) showed that chicks fed a commercial-type ration required 2.62 lb. feed for every pound of weight gain. With aureomycin, that figure was reduced to 2.37 and with penicillin to 2.34. Most commercial broiler farmers are finding about a 10 per cent reduction in the feed needed to bring their birds to marketable weight (53) from one to two weeks earlier, which is similar to the above experimental results.[5]

Present evidence for swine indicates that in cases where the addition of an antibiotic to a ration has no influence on the growth rate, there is also no improvement in feed utilization (27, 55). However, in cases where the antibiotics did stimulate growth, feed efficiency was also improved (22, 49, 56, 57). The improvement in most of these cases also amounted to approximately a 10 per cent reduction in feed consumption per unit of weight gain.

[5] Today practically all of the commercial poultry and turkey feeds and a large percentage of the feed for young pigs contain small amounts of antibiotics. Last year $17.5 million worth of antibiotics were used in animal feeds; the present indications are that their use will increase (54).

LOWER VITAMIN REQUIREMENTS WITH ANTIBIOTICS

One of the more intriguing properties of the antibiotics used in animal rations is their ability to reduce the dietary requirement for various members of the B-complex. Linkswiler and associates (58) showed that the rat's requirement for vitamin B_6 as measured by growth was cut in half when 5 mg. aureomycin were added to 100 gm. of the ration. Other antibiotics, too, reduced the rat's requirement for thiamine, riboflavin, and pantothenic acid (59). There was, however, some difference in the order of potency of the antibiotics in sparing the different vitamins.

The most striking vitamin-sparing action is that described by Daft and Schwarz (60). They maintained rats on pantothenic acid- or riboflavin-deficient diets for periods as long as a year. Each ration was supplemented with 20 mg. aureomycin per 100 gm. Many of the male rats reached weights of 500 gm. Aureomycin did not protect all rats—some died with typical signs of the vitamin deficiency. Sauberlich (61) obtained somewhat similar results over a four-week period; in his laboratory, the addition of 10 mg. aureomycin or penicillin per 100 gm. of a purified ration deficient in either thiamine, riboflavin, pyridoxine, or pantothenic acid produced growth equivalent to that obtained with approximately half the minimal vitamin requirement.

Aureomycin appears to be unique in sparing the rat's requirement for certain vitamins. This antibiotic can largely replace vitamin E and cystine which are necessary for the prevention of dietary hepatic necrosis (62–64). All of the antibiotics studied produced some growth stimulation when added to the basal ration, but only aureomycin, and to a lesser degree streptomycin and terramycin, delayed the onset of the necrosis. Aureomycin is also selective in overcoming, in rats, the citrovorum factor deficiency resulting from feeding aminopterin (65, 66).

The requirement of the chick for niacin, riboflavin, and folic acid (67) as well as for vitamin B_{12} (33) was reduced when aureomycin was added to the ration.

EFFECT OF ANTIBIOTICS ON PROTEIN NEED

Although most of the earlier studies on the nutritional effects of dietary antibiotics had to do with vitamins, more attention is now being given to other factors. One that has elicited considerable work is protein.

Antibiotics have little if any protein-sparing action when added to swine rations (56, 68), but they lower the protein requirement for poultry. In one laboratory, increased growth was seen when aureomycin was added to the rations containing various levels of protein (51, 69). Chicks on a 15 per cent protein

ration supplemented with aureomycin grew as well as those receiving 21 per cent protein. It can be argued that since the antibiotic increased the weight of the chicks both at the fourth and sixth weeks of age for every level of protein studied, the effect was not a true sparing action and that the ration was deficient in something besides protein, the missing factor being present in the protein supplement (soybean meal). Until these experiments are re-evaluated from that standpoint, it will be difficult to determine whether antibiotics produce a genuine protein-sparing effect. A similar criticism can be levelled at the other work in this field (16).

An apparent protein-sparing effect of antibiotics has been reported by Pecora (70, 71). He found that on a rice diet supplemented with small amounts of lysine and threonine, the addition of 20 mg. penicillin or aureomycin per 100 gm. produced as good growth as that obtained on a 15 per cent casein ration. The rice diet contained only 6.17 per cent protein even with the amino acid supplements.

OTHER GROWTH PROMOTANTS

Some animal species grew better when a number of other compounds were added to the rations in concentrations comparable to those of the antibiotics. The growth-promoting action of phenylarsonic acids for chicks was first reported in 1946 by Morehouse and Mayfield (72) while studying the influence of arsonic acids on experimental coccidiosis. This work has been confirmed and extended to turkeys by a number of investigators (10, 15, 73). However, it is apparent that in poultry the growth stimulation from arsonic acids is not as great as that resulting from antibiotics.

With 3-nitro-4-hydroxyphenylarsonic acid, Carpenter (74) not only increased the growth rate of weanling pigs but also increased their feed efficiency, which has also been seen by Wallace *et al.* (75), although they saw no growth stimulation.

When a mixture of quaternary ammonium compounds was added to a commercial ration at a level of 0.05 per cent, chicks gained 10 per cent more weight than those in the control group (76). These chicks had been experimentally infected with Ascaridia. The quaternary ammonium compounds had no effect on the incidence of Ascaridia infection; actually, the experimental birds were more heavily infected than the controls, but nevertheless they gained more weight.

Surface active agents such as the detergents used in the home laundry have been reported to stimulate the growth of chickens (77). When approximately 100 mg. detergent was added to 100 gm. of an all-vegetable ration, the chicks gained up to 12 per cent more weight than the controls. The growth stimulation resulting from the addition of surfactants was no greater than that obtained when either vitamin B_{12} or an antibiotic fermentation mash was used in its place. Although the growth-promoting action of detergents for chicks has been confirmed (78), more work must be done before the detergents can be ranked with the antibiotics and arsonic acids as growth-promotants.

In 1944, the growth-stimulatory action of high levels of ascorbic acid for chicks on a purified ration was reported (7). The growth stimulation was small and variable, and a number of substances, such as arabinose and sulfasuxidine, produced as good growth stimulation as ascorbic acid.

The addition of large amounts of ascorbic acid to the diet produced growth of rats even though the diet was free of some members of the B-complex. Daft (79) found that some rats grew to adult size on a purified diet free of pantothenic acid, provided it contained 2 per cent ascorbic acid. A similar vitamin-sparing action was seen when the diet was free of riboflavin. Ascorbic acid at a level of 5 per cent produced good growth in rats fed a ration that was low in thiamine (60).

MODE OF ACTION OF GROWTH-PROMOTANTS

In view of the diversity of substances that promote animal growth, it is obvious that no one explanation will cover all situations. The most frequently discussed theory is the one associating the action of the antibiotics with the flora of the gastrointestinal tract. The method whereby the antibiotics act may be one or a combination of the following:

(a) Selectively favoring the growth of microorganisms that are capable of synthesizing some unknown growth factor. The factor is then made available to the host animal.

(b) Decreasing the growth of bacteria which would ordinarily use large amounts of some essential dietary nutrient.

(c) Inhibiting the growth of microorganisms that might otherwise produce a disease.

(d) Favoring the absorption of nutrients from the gastrointestinal tract.

The proponents of the theory that antibiotics produce their effect through action on microorganisms gain support from the finding that inactivated aureomycin has no growth-promoting effect[6] (80).

With the perfection of the technique of Reyniers and his associates (82) for raising germ-free chicks, it was anticipated that a final answer would be possible to the question of how the antibiotics and other

[6] However, Stokstad and Jukes (10) reported that alkali-inactivated aureomycin stimulated the growth of chicks. Dornbush and associates (80), on the other hand, showed that the method used by Stokstad and Jukes destroyed only approximately 50 per cent of the antibiotic in the fermentation mash. Elam *et al.* (81) stated that inactivated penicillin produced growth stimulation in chicks only when the material was injected.

growth promotants operate. If these compounds stimulated the growth of germ-free birds, then obviously the effect must have been mediated through some medium other than the bacteria in the gastrointestinal tract. The recent reports from the Notre Dame workers indicate that germ-free chicks showed no growth stimulation when antibiotics were added to the ration. Furthermore, the germ-free chicks grew as well as the conventional chicks whose diets were supplemented with antibiotics. The vitamin content of the feces from germ-free and conventional birds were the same. Similar results were obtained with turkey poults (83).[7] On the basis of these results, Reyniers (83) proposes that antibiotics produce their growth-stimulatory effect through an indirect mechanism involving the thymus, lymphatics, and possibly other systems.

DIETARY ANTIBIOTICS AND HUMAN NUTRITION

Perhaps the most important result of the above investigations is that eventually cheaper and more abundant supplies of meat for human consumption may result. There is some indication that the maintenance of poultry prices in the face of rising costs may be partially attributed to increased weight gains by birds raised on antibiotic-supplemented feeds.

There are only a few reports on the nutritional effect of antibiotics in human beings, and most of them are relatively incomplete. They leave for future work the clarification of the actual and potential effects that may be expected from the supplementation of human diets with antibiotics.

Most of the reports on the use of antibiotics in human nutrition have been on the treatment of various types of anemia. The situation in this area is confusing from the standpoint of the responses obtained by antibiotic therapy and the most effective doses to be used. Clinical improvement has been observed in a few cases of pernicious anemia treated with aureomycin. The first patient so treated received 2 gm. aureomycin and 2 gm. streptomycin orally each day for thirty-two days. During that time, there was a delayed reticulocyte response and a slow increase in the number of red cells.[8] Three gm. aureomycin per day given to a second patient for a forty-day period produced an increase in the hematocrit to 43 per cent. Although an atypical reticulocyte response occurred, the clinical improvement was satisfactory. Since there was a possibility that the antibiotics improved the absorption or utilization of vitamin B_{12}, 3 mcg. of the vitamin and 3 gm. aureomycin were given each day to another patient. In this case the best clinical and hematologic response occurred. The intravenous injection of 600 mg. aureomycin per day for twenty days produced no change in the blood picture in another patient (86).

These reports on the hematologic response following the feeding of aureomycin to patients with pernicious anemia are intriguing since other reports have shown that vitamin B_{12} by mouth is inactive unless very large doses are given (87, 88). On the basis of animal studies, it may be argued that the antibiotic spares the body's requirement for vitamin B_{12} (89), probably by increasing the synthesis of the vitamin in the gastrointestinal tract (90). There is also a possibility that the therapeutic effect of the antibiotic in pernicious anemia may be mediated through a reduction in the intestinal bacteria which absorb vitamin B_{12} thus making it unavailable (86).

A series of papers from South Africa claim that penicillin both when injected and given orally produces a marked improvement in patients with megaloblastic macrocytic anemia. The first case reported by that group was a woman who was given daily injections of 400 mg. penicillin for seven days (91). The reticulocytes increased to 40 per cent shortly after the start of the injections while the red cells increased from 1.2 million to 3.3. Some eight months later the same patient returned with an equally severe anemia. Again, daily injections of 400 mg. penicillin were used. The reticulocyte response was accompanied by a marked increase in both red cells and hemoglobin.

Another report from the same group details their clinical experiences with penicillin in treating a severe case of megaloblastic anemia of pregnancy (92). Treatment with daily injections of 400 mg. penicillin increased the reticulocytes to 26 per cent, the red cells from 1.3 million to 4.3, and the hemoglobin from 3.5 to 12 per cent. The response during the month of observation was stated to be similar to that obtained with liver, folic acid, or vitamin B_{12}.

The most recent report from this group (93) is to the effect that megaloblastic anemias respond to oral penicillin only when the daily dose is 200 mg. or less. They had two patients who showed a hematologic response when receiving daily oral doses of 200 mg. penicillin and two others who showed no response to daily doses of 400 mg. It is hard to reconcile this observation with their earlier findings and those of Lichtman and co-workers (86) who obtained a hematologic response in pernicious anemia with daily oral doses of 2 to 3 gm. aureomycin.

There are two reports on the growth-promoting

[7] The work of Reyniers and associates (82) re-emphasizes the importance of a sanitary environment in nutritional studies. Evidence is beginning to accumulate that a very clean environment not only eliminates the growth-stimulating effect of antibiotics in chicks but produces better growth than that which can be obtained on the same diet supplemented with an antibiotic fed to animals in a less clean environment (84).

[8] Ungley (85) gave a patient with pernicious anemia 3 gm. aureomycin per day for five days. During that period and the subsequent five days, the hematological picture did not change. This observation cannot be accepted as a refutation of the above work since the reticulocyte response might have appeared had the therapy been continued.

effect of aureomycin fed to infants. In Italy, Perrini (94) added 25 mg. aureomycin per kilogram of body weight to the daily diets of premature infants, which resulted in slightly greater weight gain than those seen on the control diet. In Israel, Robinson (95) found that when 50 mg. aureomycin per kilogram of body weight were given to the smaller of each of eleven sets of premature twins, the treated twin gained weight faster than its sibling in all but two cases. In the latter cases, the weight gains were the same in each pair of twins. The average weight gain for the aureomycin-fed infants was 29.5 gm. per day while the controls gained 18 gm. Approximately a third of the infants in the control group died from intercurrent infection whereas none of the treated infants died.

Perhaps the most significant study of the role that antibiotics might play in human nutrition is that of Scrimshaw and his associates (96) of the Institute of Nutrition of Central America and Panama. In Guatemala, the diets of three groups of school children were supplemented with either skim milk, vitamin B_{12} (at a level of 20 mcg. per day), or aureomycin (at a level of 50 mg. per day). One group received placebos. The weight increases for the skim milk group was slightly higher than that of the placebo group while the vitamin B_{12}-supplemented group showed a considerably greater increase. The aureomycin-supplemented group showed the fastest weight gains—a rate that was almost twice that of the placebo group. In these groups, the animal protein intake averaged about 5 gm. per day. A similar study was made with another group of children whose daily animal protein intake was 13 gm. Under these circumstances, the addition of either the antibiotic or vitamin B_{12} had no influence on the growth rate. These studies are being continued to verify the action of the antibiotic on the diets made up primarily of vegetable protein.

It should be noted that there are a few reports on the deleterious nutritional effects of antibiotics. Although the evidence is not clear-cut, there are indications that some patients may develop nonspecific signs suggestive of a vitamin B deficiency when given antibiotics over an extended period (97, 98). When three undernourished men were given 2.5 to 3.0 gm. aureomycin per day, each one lost weight especially toward the end of the nine- to twelve-day period. While the aureomycin was being taken, the nitrogen retention was considerably smaller than during the control periods immediately preceding or following. The amount of riboflavin excreted in the stools decreased during antibiotic supplementation. "Serial stool cultures," however, revealed no consistent quantitative or qualitative alterations (99).

SUMMARY

The addition of antibiotics to commercial rations at levels up to 25 mg. per 100 gm. results in faster growth for most chicks, turkey poults, swine, and calves. For some of these species, compounds such as the arsonic acids and quaternary ammonium compounds also show growth-promoting effects. In most cases, the growth-promoting substance when added to the diet in small amounts not only increases the rate of gain but also permits the gain to be made more economically from the standpoint of feed consumption.

The method whereby the antibiotics act is still unknown. A number of investigators have shown that the growth promotants can spare the animals' requirement for various members of the B-complex. Whether the antibiotics act by making available to the animal some growth factor present in the diet in insufficient quantity or whether they reduce the organisms which produce an apparently innocuous disease has not been proved. It is doubtful, however, whether any one explanation will cover all of the nutritional phenomena attributed to the antibiotics.

The evaluation of antibiotics in the field of human nutrition has only started. Since the greatest growth-stimulating effects are obtained with animals raised on all-vegetable rations, the potential possibilities of improving the nutritional status of a large segment of the world's population would appear fairly bright. Before any additional theorizing is done, it will be necessary to extend the work of Scrimshaw and his associates in order to determine the magnitude of the weight gains resulting from the supplementation of an all-vegetable diet with either vitamin B_{12} or antibiotics. It is doubtful whether any dramatic effects will be seen in this country from supplementing human diets with antibiotics since, in most cases, the intake of animal protein is fairly high.

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Legends of Hot Cross Buns

Although hot cross buns have long been associated with Good Friday meals, tradition has it that they originated centuries before the Christian era. Research by the American Institute of Baking has turned up some interesting historical bits.

According to mythology, the Greeks offered to their moon goddess, Astarte, and to other of their divinities, a sacred cake called a "boun," from which the word "bun" finally evolved. These cakes appear in many of the early Grecian works of art and sculpture. It is possible that the stylized cross was used, either as an allusion to the four phases of the moon, or as a matter of convenience in breaking the cakes into four parts when offered as a sacrifice.

The Egyptians similarly honored their moon goddess by a cake offering on special days. Their cakes were called "bon," meaning ox, and were printed with a pair of horns, symbolic of the oxen or horned moon of Isis.

In the Old Testament book of Jeremiah 44: 19, there is also an allusion to sacred cakes, which could possibly be the forerunners of hot cross buns: "And when we burned incense to the queen of heaven and poured out drink offerings unto her, did we make her cakes to worship her."

In the Christian era, a new significance was attached to the symbol of the cross. Medieval churches distributed buns made of dough to communicants on Easter Sunday. In England, as far back as 1252, bakeries engaged in the forbidden practice of competing with the church by selling buns and cakes stamped with a cross.

It was believed that the buns would never mold if properly made and completed before a certain time—whether sunrise or church time is now uncertain. Undoubtedly the lavish use of spices in the cakes helped to preserve them, enabling families to keep a bun for good luck until the same season the next year.

Later, the bun lost its religious significance, and today, hot cross buns are enjoyed, not only on Good Friday, but every day throughout the Lenten season.

What's New in Frozen Foods?[1]

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THOUGH it has long been common practice for farmers and others residing in cold climates to freeze and store meat and fish and perhaps some other foods for short periods for their own personal use or for local consumption, commercial food freezing on a relatively large scale began about 1880 when mechanical refrigeration first became of commercial importance. About that time, the commercial freezing of poultry, fish, and meat was begun in the United States. Later (early in the twentieth century), the preservation by freezing of fruits and eggs was begun. Vegetable freezing is of much more recent origin, having been started on an experimental commercial scale in 1929.

Prior to 1929, foods preserved commercially by freezing were considered inferior to the fresh products. Clarence Birdseye and others emphasized the importance of *rapid* freezing, called the new process "quick freezing," and called the public's attention to the high quality obtainable in frozen foods if special care was taken in selecting foods to be frozen and emphasis placed on the speed of handling, rate of freezing, and low storage temperature.

Using careful quality control, the food freezers have been successful in obtaining a sufficiently high quality of frozen foods to be readily accepted by the homemaker. However, it has taken much effort by the food freezers to convince the public of the merits of "quick frozen foods."

PRECOOKED FROZEN FOODS

Between 1928 and 1934 a great amount of research work was carried on to determine the best methods of preparing and freezing all kinds of foods. Almost every food which we eat was frozen on an experimental scale, and the quality and economic advantage of the frozen product studied. This early work indicated that certain foods could be best frozen after cooking. Squash, potatoes, corn-on-the-cob, lobster, crab, bread, and cake were in this category. This led to the establishment of commercial freezing operations for cooked squash, lobster, crab, and a few other items. Other cooked foods were frozen commercially on an experimental scale and offered to the public, but freezing preservation was too new for their ready acceptance by the homemaker at that time.

The commercial freezing of precooked foods has advanced steadily since 1940 and is today an important factor in the frozen food business. The number of cooked food items now being offered the public is astonishingly large, including the following and numerous others:

SOUPS

- Asparagus
- Chicken Louisiana
- Chicken noodle
- Mongol purée
- Onion
- New England clam chowder
- Split green pea
- Cream of tomato
- Vegetable

ENTRÉES

Fish

- Codfish cakes
- Creamed tuna
- Halibut cutlets
- Creamed salmon
- Salmon loaf
- Salmon steaks
- Shrimp à la king
- Whole shrimp
- Shrimp sandwich spread
- Seafoods à la king

Meats

- Beef hash
- Corned beef hash
- Meat loaf
- Filet mignon
- Beef liver
- Manhattan steak with tomato sauce
- Meat balls (Spanish style)
- Pot roast of beef
- Roast beef in gravy
- Stuffed bell peppers
- Swiss steak
- Vegetable and beef stew
- Beef tips with Spanish sauce
- Lamb chops
- Lamb cutlets
- Irish lamb stew
- Roast lamb in gravy
- Pork chops
- Roast pork with dressing and gravy
- Sausage patties
- Veal fricassee
- Veal macaroni loaf

Poultry

- Chicken à la king
- Creamed chicken
- Chicken fricassee
- Minced chicken
- Chicken giblets and rice
- Chicken potpie
- Roast duck
- Turkey à la king
- Turkey hash
- Turkey loaf
- Roast turkey with dressing
- Turkey turnovers

[1] Presented at the 35th Annual Meeting of The American Dietetic Association in Minneapolis, on October 24, 1952.

SPECIALTIES

Spaghetti and meat balls	Welsh rarebit
Chili con carne	Pancake batter
Baked beans with pork	Chop suey
Rice dinner (Spanish style)	Barbecue sauce
Lima beans baked with ham	Giblet gravy
	Brown gravy
Macaroni and cheese	Chicken gravy
Pumpkin pie mix	Hors d'oeuvres
Vegetable salad	

BAKERY PRODUCTS

Angel food cake	Dinner rolls
Cup cakes	Fruit pies
Cookies	Mince pie
Waffles	Pumpkin pie
Blueberry muffins	Strawberry shortcake
Breakfast rolls	Apple turnovers

The use of precooked frozen foods offers many advantages to the homemaker. Certainly their use will eliminate much preparation labor and time. There is likely to be much less waste of materials when frozen cooked foods are used than when the homemaker does the preparation work herself. The commercial packer is able to produce cooked foods of more uniform quality than can the average homemaker. If there is a frozen food cabinet in the kitchen, pantry, or basement, she is able to keep a supply of precooked foods on hand immediately available for use when unexpected guests arrive. Such a supply is also of great help to her family when she is sick or away on a trip.

Frozen cooked foods are coming to be used more and more commercially. For example, in England, one company which operates a large chain of cafeterias and restaurants in the metropolitan areas of England now has central kitchens which are in effect food preparation factories where they prepare, cook, and freeze a large part of the foods served in its numerous, widely distributed branches. The management has found that foods can be more efficiently and uniformly prepared and cooked in central kitchens. In this country two chains have recently begun freezing operations in some districts, and two of our railroad dining car services have inaugurated the serving of precooked frozen foods. Officials of these railroads believe that both their companies and their patrons will benefit by their use. Some of the advantages which may be had by restaurant chains, railway dining car services, and institutions from the use of frozen cooked foods are:

The exact cost of each item can be predicted and controlled. Production costs should be reduced through the use of factory production methods. The amount of kitchen equipment required in a restaurant or cafeteria is reduced and less labor is required. Their use is particularly advantageous for short-order servicing; thus one of the first to use precooked frozen foods was a drugstore chain which offers quick lunches.

PRECOOKED FROZEN MEALS

During World War II when long airplane flights overseas became common, it was very difficult to serve appetizing meals to passengers and crew. Then, it was found that complete meals could be prepared and assembled on a tray and frozen. These frozen meals could be placed aboard military airplanes and reheated in special electric ovens. Recently, much experimentation has been done in an effort to determine what prepared foods are best suited for these frozen meals. The following are some of the interesting menus now being offered to the military crews on overseas flights:

Breakfasts

Glazed apples	Spanish omelette
French toast	Fried ham
Canadian-style bacon	Sweet roll

Dinners

Roast turkey	Tenderloin steak and gravy
Dressing and gravy	Potatoes Parisienne
Buttered peas	Succotash
Candied sweet potatoes	
Veal goulash	Pot roast of beef
Green beans	Mexican corn
Spanish rice	Potato puffs

Not only has the Air Force begun to use frozen meals, but certain civilian airlines operating over the Pacific have also taken up the idea.

PROBLEMS OF THE COOKED FOOD INDUSTRY

From the above, it may appear that about all there is to be done to obtain a good meal is to cook the food, rapidly freeze it, and store the products at low temperature. This is a long way from the truth, since many cooked foods are greatly changed by freezing. Cooked foods may be classified into three categories:

(a) Those which may be frozen, stored, and thawed without material change, for example: applesauce, squash, various pies, bread, rolls, cookies, cakes, and clear soups.

(b) Those which are greatly changed by freezing, storage, and reheating but which, by certain changes either in the method of cooking or in the recipe, may be so modified as to be well suited for freezing. Creamed chicken, most sauces and gravies, and cream soups fall in this category.

(c) Those which are greatly changed by freezing and reheating and which are difficult if not impossible to improve. Custards and many egg products are examples of cooked products which do not freeze well since they coagulate and "weep."

The packaging of frozen cooked foods is also a problem, since the packages must be not only air-tight but moisture- and vaporproof as well. Furthermore, they should be heat resistant.

Perhaps more should be said about the sanitary

aspects and bacteriologic problems which may be encountered in preparing, freezing, and using cooked frozen foods. There is still much argument as to whether the cooked foods should be cooled before they are put into the containers for quick freezing. If a product can be rapidly cooled on a large scale prior to packaging, as for example, soup in a jacketed kettle which may be cooled by running cold water through the jacket, it is advantageous both from the sanitary and production aspects. If, however, the product is one which it is difficult to cool in bulk, the quality may deteriorate greatly and there may also be chance for bacterial growth and contamination during slow cooling. In the latter case, it is probably better to place the heated product in a package which will stand the high temperature and then place the package directly in the freezer without any preliminary cooling. Assuming the use of a freezer of sufficient capacity to reduce the temperature of the products rapidly, danger of contamination with microorganisms or their growth during cooling is thus eliminated.

FROZEN JUICE CONCENTRATES

In the early days of the development of the quick freezing industry (1930), the freezing of fruit juices, especially orange juice, appeared to offer great commercial possibilities. Two of the largest dairy companies began freezing orange juice in small cartons for retail distribution. Although the product was of good quality, it was not readily accepted by the public. If this juice was delivered in the solidly frozen condition, the homemaker found it more difficult to thaw the product than to ream fresh oranges. On the other hand, if thawed juice was delivered, it was not as palatable as fresh juice.

About five or six years ago, it was found that if orange juice was concentrated at a low temperature, the quality of the freshly concentrated juice was excellent. It was also observed that if some fresh orange juice and water were added to the concentrate during reconstitution, the resulting product was difficult to distinguish from freshly-pressed juice. Also, if the mixture of concentrate and freshly-pressed orange juice were frozen, stored at a low temperature, and later thawed by the addition of the proper amount of cold water, the product was excellent, being substantially the equivalent in flavor and ascorbic acid content of freshly-pressed orange juice (1–3). What is even more important, the frozen orange concentrate was soft enough even at 0°F. to be easily removed from the container by a spoon and then reconstituted by mixing with cold water in a pitcher.

When the homemaker learned these facts, the orange concentrate found a ready market (4). The even newer frozen lemon, grapefruit, tangerine, and grape concentrates have been introduced commercially and are now enjoying good sales. A technique of producing frozen apple concentrate of good quality has recently been worked out by the Western Regional Research Laboratory, and in a special sale it was demonstrated to be readily acceptable to the homemaker. Today, frozen orange concentrate has found a secure place in the market.

NOVEL FISHERY PRODUCTS AND PROCESSES

Within the last few years a number of novel frozen fishery products have been introduced. First, de-veined frozen shrimp was put on the market. More recently, breaded de-veined shrimp has been prepared and frozen. This product is ready for frying in deep fat and is selling in large quantities. Other interesting, ready-prepared fishery products which seem to have commercial possibilities are frozen deviled crab and frozen crab imperial.

One great difficulty confronting the fishery industry has been the fact that a large proportion of the ocean fish are caught by trawlers and other fishing vessels operating at considerable distances from shore. As a rule, the fish are eviscerated and packed immediately after catching in crushed ice in the hold of the vessel. Even so, the fish caught during the first few days at sea are likely to be stale by the time the entire catch has been made and the vessel is back in port. From time to time, there has been an attempt made to fillet the fish at sea and then freeze the product and hold it frozen. These operations have not been successful because of the difficulty of getting the crew to do the additional work involved.

The United States Fish and Wildlife Service (5–8) has recently demonstrated that an excellent quality of frozen foods may be obtained by freezing the round fish, (i.e., before evisceration) in very cold brine at sea immediately after capture. The frozen round fish is held at 0°F. until landed. Then it is thawed in cold water and promptly filleted. The fillets are packaged and quick frozen. Contrary to the general belief that fishery products which have once been thawed will be of poor quality if refrozen, it has been proved definitely by acceptance and storage studies that the quality of these refrozen fillets is better than that which could be obtained by freezing iced fillets.

MONOSODIUM GLUTAMATE IN FROZEN FOODS

Recent studies (9, 10) of the use of monosodium glutamate for improving the flavor of frozen foods has indicated that not only is the flavor of many different frozen products markedly improved, but the frozen products containing monosodium glutamate retain their quality during storage better than the control samples (i.e., those containing no glutamate). Furthermore, the inclusion of a small amount of monosodium glutamate in frozen meat and fish retards the development of rancidity. The conclusions of Norton, Tressler, and Farkas (10) follow:

Addition of monosodium glutamate to many foods prior to packaging and freezing greatly improves their flavor and acceptability which, in general, becomes more evident during frozen storage. In many instances, color also is improved by addition of glutamate.

The pink color of fresh frozen salmon seems to be retained by the use of monosodium glutamate, whereas without such a treatment, the pink color is bleached out after a very short time in freezing storage.

Frozen green peeled shrimp treated with glutamate have a brighter color, improved sweeter flavor, and are more tender after cooking than when glutamate is not used.

Other fish, such as mackerel, haddock, and rosefish, treated with monosodium glutamate have a finer flavor for a longer period in frozen storage than the same species where glutamate is not used.

All poultry has an improved flavor, is juicier, and is of better texture where glutamate has been used in their preparation for freezing storage.

Beef, pork sausage, hams, and bacon have been much improved in flavor and texture by the use of monosodium glutamate before freezing. These meats as well as fish and poultry have retained their original high quality for longer periods in freezing storage than when glutamate is not used.

Monosodium glutamate added to vegetables before freezing effects a full, rounded-out, sweet flavor and seems to minimize the raw flavor usually encountered. Color also is improved by the use of glutamate.

The use of monosodium glutamate in frozen foods as described has seemingly prolonged the period of high quality during storage at low temperatures and has demonstrated, organoleptically, that glutamate has some properties of an antioxidant. This point was demonstrated particularly in its effect on hams, bacon, sausage, and fatty fish such as salmon and mackerel.

CONCLUSION

From this review of some of the more notable advances in the frozen food industry, it is evident that the industry is not standing still. Many novel frozen foods have been introduced, and several means of improving the quality of those already on the market have been devised.

Because of the careful quality control methods introduced by the frozen food packers, the average quality of the frozen product is steadily improving.

During the past decade millions of frozen food cabinets have been purchased. This fact alone has greatly aided the frozen food industry since it has made frozen foods available to a great number of homes far from retail stores, and the homemaker can maintain the frozen products at the high quality level at which they were purchased.

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Point IV Dietetic Activity in Central America

Through The Institute of Inter-American Affairs, which is the regional office of the Technical Cooperation Administration, the United States is cooperating with seventeen governments in Latin America in carrying out health programs. The programs are being administered by Latin American government agencies known as *Servicios*, which are staffed jointly by personnel from the United States and nationals of the Latin American country and are financed by contributions from the United States and the Latin American government. In most cases the Latin American government supplies by far the major portion of both personnel and funds.

El Salvador and Costa Rica requested and are using the consultant services of a qualified dietitian. The work at present consists primarily of assistance in planning and organizing hospital dietetic services. A number of hospitals of various sizes are being built or planned, and the dietitian is working closely with the administrators and architects on layouts, operation plans, and equipment recommendations.

Among the many problems are those of planning an operation in which practically no trained supervisors are available, and consequently there is little possibility of training personnel adequately. The employees are not accustomed to mechanical equipment or sanitary food handling procedures. Often electricity, hot water, and steam supplies are very limited and much primitive equipment and many hand operations must be used. Mechanical maintenance is limited which often makes it inadvisable to install complicated equipment, such as dishwashing machines. Orders for equipment take from six months to a year for delivery and are very costly because of shipping charges.

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Nonfat Dry Milk Solids in Food Preparation[1]

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DURING the past few years there has been a tremendous growth in the use of dry milk solids in commercial food products, in large quantity cooking, and in home cooking. Dry milk solids offer the advantages of economy and convenience in handling and storage.

There are a number of forms of dry milk solids—whole, nonfat, buttermilk, and whey. The two most widely used are whole and nonfat milk solids. Whole milk solids are more expensive and more difficult to store (because of the rancidity problem) than nonfat milk solids. Therefore, the greatest interest is in the nonfat milk solids.

The composition of nonfat and whole milk solids is listed in Table 1, with the figures for fluid whole milk for comparison. The principal deficiencies of nonfat milk solids, as compared to fluid whole milk, are in fat and vitamin A. In planning diets using considerable quantities of nonfat milk solids, other foods should be included to compensate for these lacks.

Two methods are used for manufacturing nonfat milk solids—spray drying and atmospheric roller drying. The two products differ chiefly in solubility, the spray-dried product being more soluble. According to figures of the Bureau of Agricultural Economics (1), the 1950 production of nonfat dry milk solids was 881,000,000 lb., equivalent to 9,885,000,000 lb. fluid skim milk. Of this amount, 624,000,000 lb. were spray-dried, and 257,000,000 lb. were roller-dried.

The grades for milk solids are based on production standards, rather than use, and include such factors as butterfat content, moisture, titratable acidity, solubility, bacterial load, sediment, and flavor. O'Malley (2) recommends the following restrictions in use. Spray-dried milk solids should be used in cakes and similar products. Either spray or roller-dried solids may be used in yeast-raised products, but the milk must have been heat-treated before drying to inactivate the compounds in raw milk which interfere with development of the dough. On the other hand, milk solids for cottage cheese should be pasteurized only, as higher temperatures interfere with curd formation.

For most food preparation uses, it is customary to purchase a form suitable for general purpose use. However, if some special use is contemplated, it would be advisable to specify this before purchase.

TABLE 1

Approximate composition of nonfat and whole dry milk solids and fluid whole milk

NUTRIENT	DRY NONFAT MILK	DRY WHOLE MILK	FLUID WHOLE MILK
Protein (%)	37	27	3.3
Fat (%)	<1.5	26	3.5
Lactose (%)	51	38	4.5
Minerals (%)	8	6	0.7
Water (%)	3 or less	2–3	88
Vitamin A (I.U./lb.)	165	6360	650
Riboflavin (mg./lb.)	9.3	6.63	0.8

SOLUBILITY

The solubility of milk solids is of importance in food preparation, especially in products such as beverages, soups, and sauces which have a high water content. Howat and Wright (3) give 50°C. (122°F.) as the temperature of maximum protein solubility. Choi, Tatter, and O'Malley (4) point out that lactose is non-crystalline in fresh nonfat milk solids of low-moisture content. As the powder absorbs moisture, the lactose changes to the α-lactose hydrate which is much less soluble. The critical moisture level is listed as 7.5 to 8.0 per cent. Paul and Plummer (5) found that a moisture content of about 7 per cent was accompanied by loss of solubility, caking, browning, and development of undesirable odor and

[1] Journal article No. 1416 from the Michigan Agricultural Experiment Station. Presented at the 35th Annual Meeting of The American Dietetic Association in Minneapolis, on October 24, 1952.

flavor. Moisture content should be included as one of the purchase specifications, and the milk solids should be protected from moisture after purchase. Actual tests for moisture content require laboratory equipment.

USE IN HOME FOOD PREPARATION

Morse, Davis, and Jack (6) studied the effect of various proportions of ingredients on the viscosity and gel strength of several pastes containing nonfat dry milk solids. A summary of their findings is given in Table 2. They also give curves for prediction of the gel strength or viscosity according to the proportions of milk solids and flour to liquid.

The same authors reported the results of using nonfat dry milk solids in a number of prepared foods, including white sauce, cream soups, custards, egg nog, chocolate pudding, waffles, angel cake, butter sponge cake, and plain butter cake. They found that addition of milk solids caused changes in the texture of products such as sauces, soups, puddings, and custards, increased the browning of waffles, and that the addition of large amounts gave an undesirable flavor. They concluded that moderate amounts could be used successfully in all these recipes.

Paul, Brill, and Means (7) published a bulletin on use of nonfat dry milk solids in food preparation. The aim in this work was to increase the milk solids content of the foods over that given by the use of fluid milk. Adjustments were made in the recipes where necessary to compensate for this. Swickard (8) lists recipes using milk solids usually on the fluid milk equivalent basis, with suggestions for possible increases in milk solids and any adjustments needed. Miller and Personius (9) have also published information on use of milk solids in food preparation.

Nearnberg (10) studied the effect of use of milk solids on the staling of cake. She found that amounts up to 14 per cent of the weight of flour could be added without change, but that 20 per cent required adjustment of the other ingredients to produce an acceptable cake. The additional milk solids were not effective in retarding staling of the cakes.

TABLE 2

Effect of varying amounts of ingredients on gel strength or viscosity of pastes containing nonfat dry milk solids

VARIATION	GEL STRENGTH OF THICK PASTE	VISCOSITY OF THIN PASTE
Increased dry milk solids	increased*	increased*
Increased sugar	decreased	increased
Increased fat	decreased	no effect
Increased NaCl	no effect	slight increase
*p*H decreased to 6.0†	decreased	curdled
*p*H increased to 7.7 (thick paste) or 8.0 (thin paste)	inconsistent	slight increase

* Could be adjusted by reducing amount of flour.
† Normal *p*H 6.9.

USE IN QUANTITY FOOD PREPARATION

The use of nonfat dry milk solids in food preparation for the women's dormitories at Michigan State College is being investigated. The recipes are planned to avoid reconstitution of the milk solids to fluid milk, since reconstitution counteracts much of the convenience factor by adding another step. In addition, the fluid form is heavy to handle and requires refrigeration just as fresh milk does. In baked products, it is no problem to use the dry solids, since they are sifted with the flour. However, in products such as soups, sauces, and puddings, another technique must be used, because the ratio of fluid to dry ingredients is so much higher. The method generally used at the college is to prepare a thin paste of the flour, milk solids, and any other dry ingredients, and a portion of the water. This water is warm, so that the milk solids dissolve more easily. The remainder of the water is brought to a boil in a steam-jacketed kettle. Then the paste is added gradually with stirring, and the whole is cooked until thick.

The products which have been tested at Michigan State College are listed in Table 3. No attempt has been made to adjust the fat content of these recipes to compensate for the fat present in fluid whole milk. The comments illustrate several important considerations in the use of milk solids. One is that a product made of nonfat milk solids and resembling whipped cream will cause disappointment because it does not taste like whipped cream. Another is the possibility of using milk solids in mixes which can be prepared in large amounts and held for later use. The staff are now working on the conversion of the chocolate and butterscotch pudding recipes to a mix-form, as well as on their suitability for cream pies. A third is the observation that puddings made with milk solids seem to have less tendency to form a "skin" on the surface during cooling. If this is borne out in further work, it could mean a considerable saving in the preparation of such products.

Several products have been tested in the laboratory, but not as yet in the dormitories. These include tapioca cream pudding, scalloped potatoes, muffins, and baked custard. Scalloped potatoes are rather difficult since the milk solids tend to form lumps. Mixing the dry ingredients with the sliced potatoes so as to coat each slice before turning into the baking pan seems to be the most satisfactory way to avoid this difficulty.

The comparative cost figures for certain of these products are listed in Table 4. The nonfat milk solids are purchased in 50-lb. bags with polyethylene liners. These bags are stored in room-temperature bins. When these calculations were made (March,

1952), the cost of nonfat milk solids was $10.43 per 50 lb., or approximately 20.8 cents per gallon when reconstituted, as compared to 58 cents per gallon for fluid whole milk at that time. However, the milk solids content of many of the recipes is increased over that of fluid milk, which would tend to lessen somewhat this price differential. Even on this basis, the savings are substantial in many cases. It has been calculated that the use of nonfat milk solids instead of fluid milk for all the institutional food preparation on the Michigan State campus would make possible a saving of $16,000 yearly.

Another investigation of the use of nonfat dry milk solids in a college food service department is being conducted at The Pennsylvania State College. Langdale (11) states that milk solids are being used at levels of 14 oz. per gallon for fluid and semi-fluid products, and 1 lb. per gallon for bakery products. These workers find the lower amount more satisfactory for sauces and such products because many of their tasters object to the extra sweetness resulting from a higher percentage. In this connection, it is interesting to note that the industry is working on a new nonfat milk solids product which has about half the lactose removed. This is still on an experimental basis and is not available on the market as yet.

Several articles have been published giving information on use of nonfat milk solids in quantity cookery. Knickrehm, Harris, and Longrée (12) gave formulas for mixes containing milk solids for plain, white, cocoa, chocolate, and spice cakes. They calculated that the plain cake mix cost about one-half as much as a similar commercial mix on the per pound basis, and about two-thirds as much on the per layer basis. Reed and Eckles (13) reported that the addition of 4 to 6 per cent milk solids to cream for whipping (a) reduces drainage; (b) improves uniformity of texture, smoothness and resistance of body, flavor, and nutritive value of finished whipped

TABLE 3

Products containing dry milk solids tested at Michigan State College

PRODUCT	INCREASE IN DRY MILK SOLIDS OVER USE OF FLUID MILK	RESIDENCE HALLS			COMMENTS
		Number of halls where product was tried	Number with favorable reaction to product	Number with unfavorable reaction to product	
Biscuits	3.2×	7	6	1	Unfavorable comment on dryness of dough when recipe was multiplied seven times.
White sauce	1.7×	5	5	—	
Lemon whip	—	3	—	3	Not actually served, because staff considered product unsatisfactory. An appearance like whipped cream caused disappointment when tasted.
Chocolate pudding	1.7×	6	6	—	Products made with milk solids seem to have less tendency to form surface "skin" on cooling than when made with fresh milk.
Butterscotch pudding	slightly less	5	5	—	
Butterscotch pie filling	1.2	7	3	4	Unfavorable reaction chiefly because product was different from that usually served.
Pineapple whip dressing	—	6	5	1	Thickened pineapple juice folded into whipped dry milk solids. Used on fruit salad, ham, gingerbread. Can be kept four to five days in refrigerator.
Griddle cakes	no increase	4	4	—	Browns well. Batter tends to thicken on standing.
Cocoa mix	1.1	4	4	—	Mix can be made in larger amounts and packaged for later use.

TABLE 4

Comparison of cost of products using nonfat milk solids instead of fluid whole milk (March, 1952)

PRODUCT	COST		SAVING WITH DRY MILK SOLIDS
	Dry milk solids	Fluid milk	
			%
Butterscotch pudding	$0.7830/gal.	$1.0963/gal.	28.55
Chocolate pudding	0.6752/gal.	0.8730/gal.	22.65
Tapioca cream	0.6230/gal.	0.9448/gal.	34.06
Baked custard	1.6992/100 portions	2.3616/100 portions	28.04
White sauce (medium, using butter)	0.8856/gal.	1.0409/gal.	14.91
Baking powder biscuits	1.0107/100	1.0500/100	1.63*
Muffins	1.1624/100	1.2248/100	5.09*
Scalloped potatoes	3.19/100 portions	3.81/100 portions	16.27

* Small cost saving but great improvement in quality and ease of manipulation. The amount of dry milk solids was increased 2½ to 3 times the amount required for reconstitution on basis of solids in whole milk.

cream; and (c) makes lower butter-fat cream whippable. Stamberg (14) stated that the addition of 4.5 to 6 per cent milk solids, calculated on the weight of the flour, gives bread with milk solids equivalent to the use of fluid skim milk, and that the dry milk solids may be increased to 12 per cent with excellent results. Hussemann (15) compared the use of fluid, dry whole, dry nonfat, and evaporated milk in scalloped potatoes, baked custard, chocolate blanc mange, and creamed salmon and peas. She found that the milk solids could be increased within limits (usually 10 to 20 per cent) without altering the acceptability of the product and stated that further increases might be possible if the recipes were altered to allow for such effects as the thickening action of the milk solids. This illustrates again the fact that increasing the milk solids may call for recipe adjustments. Recipes for use of nonfat dry milk solids in quantity cookery are contained in recipe cards prepared by the American Dry Milk Institute.

CONSUMER ACCEPTANCE

Several studies already reviewed have given indications as to the customer acceptance of products made with nonfat dry milk solids. Other papers of interest include those of Bailey (16) and Jack and Haynes (17). Bailey (16) reported on three studies of the effect of addition of milk solids on bread consumption. Studies of consumption of water bread versus water bread plus 6 per cent milk solids showed that in one series involving 900 young men, the addition of milk solids increased bread consumption 3.3 per cent; in another study on 220 boys, the increase was 5 per cent. In both cases the subjects did not know that any alteration had been made in the bread formula. In another study in a college cafeteria where the two breads were labeled and offered simultaneously, 50 per cent more chose the bread containing milk solids. Jack and Haynes (17) also studied the effect of milk solids on bread consumption. Their subjects were 320 boys, eight to sixteen years old. They tested four levels of milk solids—0, 6, 14, and 20 per cent of the weight of flour—for two eight-week periods for each level. The order of presentation of the different levels was altered in the second series, to avoid any cumulative effect. The average consumption was as follows, using the consumption of the bread with no milk solids as 100 per cent: 6 per cent milk solids, 104.4 per cent; 14 per cent milk solids, 107.5 per cent; 20 per cent milk solids, 112.6 per cent. The amount of water added to the dough was adjusted at each level to compensate for the extra solids content. At the 20 per cent level, the sugar in the recipe was reduced to avoid excessive browning of the crust.

SUMMARY

The use of nonfat dry milk solids in food preparation offers a number of advantages: economy, ease of storage, lack of weight, ease of incorporation in many recipes such as bakery products, and possibility of increased nutritive value in many foods. However, there are a number of restrictive considerations as well: need for altered preparation techniques for incorporation into fluid and semi-fluid products, need for adjustments of recipes if large amounts are used, and possible necessity of supplementation by other foods to compensate for decreased fat and/or vitamin A content of the diet. Nonetheless, the advantages seem to outweigh the restrictions, and customer reaction to products containing nonfat milk solids has been very favorable. The indications, therefore, are for an increasing use of this form of milk solids in quantity food preparation.

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BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

Luther Emmett Holt—March 4, 1855–January 15, 1924

Infant nutrition began to develop as a scientific study in the United States in the last quarter of the nineteenth century with the establishment of pediatric clinics by Abraham Jacobi (1830–1919) and the development of a milk formula by Thomas Morgan Rotch (1849–1914). However, it was not until 1894 that the mothers of this country had any simple, yet reliable material to read to help them in the feeding of their babies. It was in that year that Luther Emmett Holt published a sixty-six-page book titled *The Care and Feeding of Infants*. This book was, for a quarter of a century, the infant bible of the country; it went through seventy-five printings, with revisions every two years, and was translated into Spanish, Russian, and Chinese. Holt recommended a series of 20-oz. formulas of part top milk and part whole or skim milk.

In 1901 Dr. Holt succeeded Jacobi as Professor of Diseases of Children at the College of Physicians and Surgeons in New York and remained there for twenty years, as the dominant figure in the nation on problems of child health. He was serious, hard-working, and meticulous in everything. He has been described as a small, slender man, immaculately dressed, his hair parted exactly in the middle, and with an earnest manner and a low clear voice. He was a clear thinker and tireless worker. His lectures were events; they were formal, beginning and ending on the minute with the topic clearly and completely presented.

Luther Emmett Holt was born March 4, 1855 in Webster, New York, and grew up on a farm in a family with Puritan traditions. He was educated at the local academy, entered Rochester University when sixteen years old, and received his bachelor's degree at twenty. After a year of teaching, he started to read medicine in the office of Dr. Whitlock of Rochester, then studied medicine at Buffalo Medical College, and received his degree in 1880 from the College of Physicians and Surgeons in New York City.

Following an internship at Bellevue Hospital, he started general practice, but began to think of specialization in medical disorders of childhood. He served as visiting physician at several hospitals for children, always recording, tabulating, and analyzing the data obtained. Throughout his life he published many clinical articles on diseases in childhood.

Dr. Holt married Linda Mairs in 1886 and the wedding trip was by horse and buggy in the Shenandoah Valley; he had four sons, one of whom has followed him in a medical career in pediatrics. In a letter to one of his sons in March 1920, Dr. Holt wrote, "He serves himself best who serves his fellow man best."

Holt was one of the founders of The Babies Hospital and was on the first board of directors of the Rockefeller Institute, where he was closely associated with early research studies on the bacteriology of milk, meningitis, and infant diarrhea. He was a leader in the American Child Health Association. Among other offices, he was an editor of the *American Journal of Diseases of Children*, and twice President of the American Pediatric Society. Following World War I, he attended the Cannes Conference, and himself wrote the child welfare program later embodied in the Health Organization of the League of Nations.

In 1923 Dr. Holt went to China as Visiting Professor of Pediatrics at Union Medical College in Peking. In his last few years he had had to slow down because of the return of heart symptoms first diagnosed in 1911. He died in Peking, January 15, 1924.

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Effect of Protein Source on Maintaining Blood Sugar Levels after Breakfast[1]

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SEVERAL investigators have demonstrated that the amount of protein in the breakfast is an important factor in the maintenance of the blood sugar level in the late morning hours. Conway (1) studied the blood sugar levels of fourteen women following two breakfasts, one providing 67 gm. carbohydrate, 13 gm. fat, and 5 gm. protein (407 calories) and the other 34 gm. carbohydrate, 15 gm. fat, and 25 gm. protein (362 calories). A comparison of the blood sugar levels following these breakfasts showed that the high-carbohydrate, low-protein meal resulted in a hypoglycemic lag between the second and third hours, and that during this hypoglycemic lag the subjects experienced a sensation of hunger. It was also found that there was a more constant blood sugar level following the breakfast containing the larger amount of protein.

Orent-Keiles and Hallman (2) studied the blood sugar levels of six or seven women after the consumption of eight different breakfasts, one of which consisted of black coffee only. In the other breakfasts, the caloric value varied from 359 to 758, protein from 7 to 25 gm., carbohydrate from 50 to 75 gm., and fat from 15 to 40 gm. In this study the blood sugar curves characteristic of a normal response to glucose were obtained following the breakfasts containing 7 to 17 gm. protein, 50 to 67 gm. carbohydrate, 15 to 21 gm. fat, with a caloric variation of 359 to 515. There was a rapid increase over the fasting level within the first half hour after the breakfasts which was followed by a fall to the fasting level at the end of 3 hr. Following the breakfasts containing from 22 to 25 gm. protein, derived chiefly from milk or eggs, 51 to 75 gm. carbohydrate, 24 to 40 gm. fat, with a caloric variation of 511 to 758, the postprandial rise in blood sugar was also normal. The average maximum level was lower than the average following the other group of breakfasts containing less protein, and the return to the fasting level was delayed beyond the usual 3-hr. period.

Bryant *et al.* (3) investigated the effect of the amount of protein in breakfast on the maintenance of the blood sugar level following the meal. The study involved four breakfasts. Two contained approximately 10 gm. protein, one built around cereal and milk and the other around eggs and milk. The other two breakfasts contained 25 gm. protein, one built around cereal and milk and the other around eggs and milk. The data showed that in the case of the low-protein breakfasts, the blood sugar levels were below the fasting level in 3 hr. and significantly so at the end of 3½ hr. In the case of the high-protein breakfasts, the blood sugar levels were not significantly different from the fasting levels at the end of 3½ hr.

Since the protein in Orent-Keiles and Hallmans (2) high-protein breakfasts was chiefly of animal origin, the question has been raised as to the importance of the protein source in the maintenance of the blood sugar level following breakfast. In order to throw some light on this question, Bryant *et al.* (3) compared the blood sugar levels of ten subjects following two types of breakfasts as regards the source of the protein. In one, the protein was chiefly of animal origin, and in the other, chiefly of plant origin. They concluded that the source of the protein was unimportant in the maintenance of the blood sugar level following the breakfasts studied.

Because of the fact that in the studies reported up to the present time, breakfasts in which almost all the protein was of animal origin were not compared with breakfasts in which practically all the protein was of plant origin, there might be some question as to the effect of the origin of the protein on the maintenance of the blood sugar level following breakfast. To gain further information concerning this question, the experiment herein reported was carried out.

[1] This work was generously supported by a research grant from the Cereal Institute, Inc., Chicago. Received for publication December 9, 1952.

[2] The authors wish to thank Dr. Fred W. Schueler for reading this manuscript critically. Calculations were checked by the University Statistical Service.

TABLE 1

Content and proximate composition of four breakfasts

FOOD	WEIGHT	PROTEIN	FAT	CARBOHYDRATE	CALORIES
Breakfast Furnishing Protein Which Was 95 Per Cent of Animal Origin					
	gm.	*gm.*	*gm.*	*gm.*	
Grapefruit juice	200	0.8	0.2	18.4	79
Glucose	20	—	—	20.0	80
Eggs, 2 fried	108	13.8	12.5	0.8	170
Butter together	7	—	5.7	—	51
Jelly	30	—	—	19.1	76
Bacon, broiled	14	3.6	8.8	0.4	95
Milk, whole	244	8.5	9.5	12.0	169
Chocolate sirup	28	0.7	0.3	16.5	72
Total		27.4	37.0	87.2	792
Breakfast of Plant Protein					
Orange juice	100	0.8	0.2	11.0	49
Bread, white, enriched	46	4.0	1.4	23.8	119
Peanut butter	30	7.8	14.4	6.4	186
Cereal*	45	5.5	1.0	34.4	172
Soybean milk, dry	16	6.6	2.8	3.9	67
Vegetable fat	11.5	—	11.5	—	104
Brown sugar	10	—	—	9.5	38
Butter	5	—	4.1	—	37
Total		24.7	35.4	89.0	772
Breakfast of Bryant *et al.* (3)—Protein Predominantly of Animal Origin					
Fruit	90	0.5	0.1	20.2	86
Egg, soft cooked	50	6.4	5.8	0.4	79
Bacon, broiled	30	4.2	8.0	0.6	93
Toast, white	60	5.2	1.2	31.6	158
Grape jelly	20	—	—	15.0	61
Butter	15	0.1	12.0	—	109
Milk, whole	240	8.4	9.4	11.8	165
Total		24.8	36.5	79.6	751
Breakfast of Orent-Keiles *et al.* (2)—Protein Predominantly of Animal Origin (values given by authors)					
Citrus fruit juice, ½ cup					
Bacon, broiled, 2 strips					
Bread, white, 2 slices					
Butter, 2 squares					
Preserves, 2 Tbsp.					
Cream, light, 2 Tbsp.					
Sugar, 2 tsp.					
Eggs, boiled					
Total		25.0	40.0	75.0	758

* Farina and soybean milk were cooked together, cooled, and fried in the vegetable fat. The brown sugar was served with the fried mush.

THE BREAKFASTS

Two breakfasts which were very similar in proximate composition but in which the source of the protein which they contained was different were used for comparing the effect of the protein source on the blood sugar level following breakfast. In one of these the protein was 95 per cent of animal origin and in the other it was almost entirely of plant origin. The breakfast menus used are shown in Table 1 along with data on their proximate composition, computed from data compiled by Bowes and Church (8). Since Orent-Keiles and Hallman (2) and Bryant *et al.* (3) have reported on work similar in design and execution to our own, their breakfast menus, together with the proximate composition, are also included in Table 1.

THE SUBJECTS

Punschel (4) and Brown (5) have shown that the average postabsorptive blood sugar level is quite constant between the ages of sixteen and thirty-four years. Lewis and Benedict (6) and Woodyatt (7) found no consistent difference between the blood sugar levels of males and females. With these facts in mind, a group of thirteen normal subjects, five females and eight males, between the ages of sixteen and twenty-seven years, was selected for this study.

DETERMINATION OF THE BLOOD SUGAR

A blood sugar curve was made once for each subject following each of the experimental breakfasts. The procedure was as follows: each subject came to the laboratory at 7:00 A.M., at which time 0.2 ml. finger-tip blood was drawn for fasting sugar determination. The experimental breakfast was eaten and 30 min. later a second blood sample was obtained. Further blood samples were taken every half-hour for a period of 3½ hr. In the opinion of Conn (9), determination should be made every 30 min., in establishing a blood sugar curve. During the after-breakfast period the subjects were allowed the freedom of the laboratory, but were kept relatively quiet since Rakestraw (10) reports that strenuous exercise, even of short duration, increases the blood sugar level.

When the blood samples were drawn, they were placed in centrifuge tubes each containing 0.5 ml. of 2 per cent sulphuric acid and 4.3 ml. of 1.25 per cent sodium tungstate solution. After standing for 15 min. the mixture was centrifuged for 6 min, and the blood sugar determinations were carried out within 10 hr. The samples were refrigerated until the determinations were made.

The Gibson (11) micro-method of sugar determination was employed for analysis. The procedure was as follows: 1 ml. of the filtrate from the centrifuge tube was placed in a test tube graduated at 25 ml.; 1 ml. distilled water and 2 ml. alkaline copper tartrate

solution were added to the 1 ml. filtrate. This mixture was placed in a boiling water bath for exactly 6 min. and then cooled. Then 2 ml. arsenophosphotungstate acid reagent was added. The mixture was agitated until all the gas had formed and escaped. Five min. were allowed for color development. The solution was diluted to 25 ml. with distilled water and read in a Coleman Jr. colorimeter, at a wave length of 690 mμ. The glucose values were calculated from a standard curve previously determined.

The technique appeared to be valid in our hands since the fasting values fell within the normal range, which is 80 to 120 mg. per 100 ml. The reliability of the technique was determined by the following procedure: A standard sugar solution was made, and seventy paired determinations were done on different occasions. A comparison of the paired values showed that they were not significantly different.

ANALYSIS OF THE DATA

The statistical formulas used in the analysis of the data were as follows:

(a) *Mean*

$$M = \bar{x} = \frac{\sum x}{n}$$

(b) *Variance of the sample*

$$v = \sigma^2 = \frac{\sum (x^2) - \frac{1}{n} (\sum x)^2}{(n - 1)}$$

(c) *Standard deviation of the sample*

$$\text{SD} = \sigma = \sqrt{\text{v}}$$

(d) *Significance of difference of means, related samples*

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\Sigma \text{diff}^2}{n(n-1)}}} \qquad df = n - 1$$

(e) *Significance of the difference of means, independent samples*

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\left(\frac{n_1\sigma_1^2 + n_2\sigma_2^2}{n_1 + n_2 - 2}\right)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$df = n_1 + n_2 - 2$$

(f) *df*. Degrees of freedom permitted in determining the value of *t*.

(g) In the calculation of the significance of differences, the null hypothesis was rejected at the 5 per cent level of confidence.

(h) The method of analysis of variance was also applied to the data, but since the results were the same as those found by the *t*-test, these calculations are not included.

Since the mean fasting levels of the group of thirteen subjects before the experimental breakfasts began were not significantly different, it is permissible to compare the mean blood sugar levels at each sampling interval after the breakfasts. This is done in Table 2 and Figure 1. The data showed that there was only one significant difference among the blood sugar levels following the two breakfasts. This occurred 30 min. after the breakfasts when the blood sugar level following the animal protein breakfast was significantly greater. At all other sampling periods, there were no significant differences between the blood sugar levels following the two breakfasts. It is concluded from these data that neither breakfast offered any real advantage over the other as regards capability of elevating blood sugar levels or of sustaining blood sugar levels following the meal.

Another point of interest is brought out in Table 3. Here, the ability of the animal and plant protein breakfasts to maintain the blood sugar above the fasting level is shown. An examination of the data shows that both the plant and animal protein breakfasts resulted in blood sugar levels that were signifi-

TABLE 2

Mean blood sugar levels of thirteen subjects following breakfasts containing protein almost wholly of plant and animal origin respectively, together with statistical comparison

SAMPLING INTERVAL	PLANT PROTEIN BREAKFAST		ANIMAL PROTEIN BREAKFAST		DIFFERENCES		SIGNIFICANCE OF DIFFERENCES	
	Mean blood sugar	S.D.*	Mean blood sugar	S.D.*	Means	S.D.*	t value	Per cent
	mg./100 ml.		*mg./100 ml.*					
Fasting	101.08	2.92	100.00	4.47	1.08	4.73	0.79	30
30 min.	139.38	8.27	144.31	9.38	4.93	5.34	3.19	1
60 min.	115.92	5.86	119.38	9.47	3.46	8.87	1.35	19
90 min.	112.62	3.96	110.92	4.82	1.70	4.19	1.40	19
120 min.	109.54	3.83	108.52	4.84	1.02	5.14	0.67	55
150 min.	108.00	3.92	105.69	4.72	2.31	5.84	1.37	19
180 min.	107.54	2.65	104.92	4.58	2.62	4.81	1.89	9
210 min.	103.15	3.16	103.08	4.51	0.07	5.06	0.05	99

* Standard deviation.

TABLE 3

Comparison of postprandial blood sugar changes from fasting levels after breakfasts of all-plant protein and of primarily-animal protein

SAMPLING INTERVAL	PLANT PROTEIN BREAKFAST				ANIMAL PROTEIN BREAKFAST			
	Difference from fasting level	S.D.*	Significance of differences		Difference from fasting level	S.D.*	Significance of differences	
			t value	Per cent			t value	Per cent
	mg./100 ml.				*mg./100 ml.*			
30 min.	38.30	6.78	19.56	0.1	44.31	8.30	18.17	0.1
60 min.	14.84	4.26	12.07	0.1	19.38	7.87	8.53	0.1
90 min.	11.54	3.63	7.88	0.1	10.92	3.88	9.75	0.1
120 min.	8.46	3.44	8.55	0.1	8.52	4.18	7.08	0.1
150 min.	6.92	2.49	13.39	0.1	5.69	4.43	4.45	0.1
180 min.	6.46	2.51	8.90	0.1	4.92	4.50	3.79	1.0
210 min.	2.07	2.58	2.79	2.0	3.08	2.89	3.69	1.0

* Standard deviation.

cantly above the fasting level throughout the 3½-hr. sampling period.

In general, it is concluded that breakfasts of almost identical proximate composition, but with the protein in one case derived almost wholly from animal sources and in the other almost wholly from plant sources are equally effective in maintaining blood sugar above normal fasting levels over a 3½-hr. period.

Orent-Keiles and Hallman (2) followed the blood sugar levels of six subjects for 3 hr. after a breakfast in which the protein was chiefly of animal origin. Bryant *et al.* (3) followed the blood sugar levels of a group of ten subjects for 3½ hr. after a breakfast in which the protein contribution was chiefly of animal origin. Data from these studies are shown in Table 4. Since Orent-Keiles and Hallman (2) report blood sugar levels only every hour after the first hour following breakfast and terminated their experiment at the end of 3 hr., comparisons with our data can be made only at coincident intervals included in the respective sets of data.

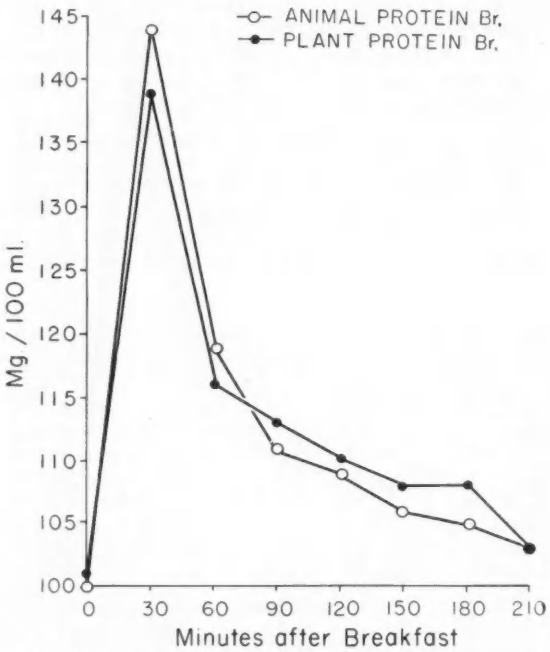

FIG. 1. *Comparison of blood sugar levels following breakfasts in which almost all of the protein was of animal origin with those following breakfasts in which the protein was nearly all of plant origin.*

Because the average fasting blood sugar levels for the subjects employed by Orent-Keiles and Hallman, Bryant *et al.*, and ourselves are significantly different from one another, legitimate comparisons of the three sets of data can be made only on the basis of differences from the respective fasting blood sugar levels. A comparison of the changes in blood sugar levels from the fasting levels at each sampling period following the four comparable breakfasts described in

TABLE 4

Postprandial blood sugar changes found by Bryant et al. *(3) and Orent-Keiles* et al. *(2)*

SAMPLING INTERVAL	BREAKFAST OF BRYANT *et al.* (10 SUBJECTS)		BREAKFAST OF ORENT-KEILES *et al.* (6 SUBJECTS)	
	Difference in postprandial blood sugar	S.D.*	Difference in postprandial blood sugar	S.D.*
	mg./100 ml.		*mg./100 ml.*	
Fasting	86.40	7.77	67.00	2.94
30 min.	40.00	14.87	36.33	11.77
60 min.	10.70	14.52	9.50	2.63
90 min.	6.10	15.08	—	—
120 min.	5.90	10.29	9.83	4.42
150 min.	2.30	6.08	—	—
180 min.	3.20	5.58	7.33	5.85
210 min.	1.50	9.89	—	—

* Standard deviation.

Table 1 is presented in Table 5. The data are compared graphically in Figure 2. In only four instances were the changes in blood sugar levels significantly different. At the 60-min. sampling, there is a greater increment over the fasting blood sugar level following the consumption of both of our breakfasts than Orent-Keiles and Hallman and Bryant *et al.* found following a breakfast in which the protein was chiefly of animal origin. At the 120-min. sampling, Orent-Keiles and Hallman reported a higher blood sugar level than that found by Bryant *et al.*, although both breakfasts contained protein which was chiefly of animal origin. At the 150-min. sampling, we found a higher average blood sugar level following the breakfast in which the protein was almost wholly of plant origin than Bryant *et al.* found following a breakfast where the protein was chiefly of animal origin.

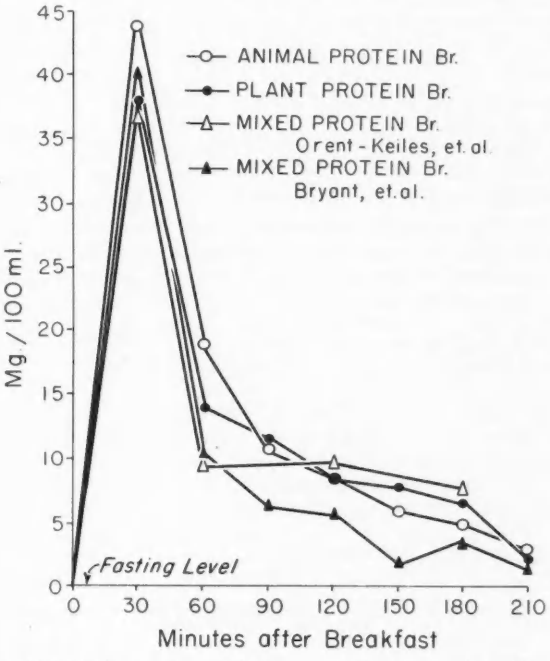

FIG. 2. *Comparison of differences in blood sugar from the fasting level following breakfasts which supplied protein from various sources.*

Although it is generally accepted that protein in breakfast is important in maintaining the blood sugar above the fasting level following the meal, the data presented in Table 5 show quite conclusively that whether the protein is derived from plant or animal sources is of no consequence.

SUMMARY AND CONCLUSIONS

Data were collected from 13 normal subjects, 8 males and 5 females between the ages of sixteen and twenty-seven years, relative to the effect of the protein source in breakfast on the course of the blood sugar level following breakfast. In addition, data presented by other investigators were compared with ours. As far as the breakfasts considered are concerned, the data presented justify the following conclusions:

(a) Breakfasts in which the protein was 95 per cent of animal origin were equally as effective in maintaining the blood sugar above the fasting level as breakfasts in which the protein was almost exclusively of plant origin.

(b) The consumption of breakfast in which the protein is a combination derived from animal and plant sources is as effective in elevating and maintaining the blood sugar above the fasting level as the consumption of a breakfast in which the protein is almost wholly of either plant or animal origin.

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(3) BRYANT, K., MARTIN, C., SCHUMACHER, M. T., DAUM,

TABLE 5

Comparison of blood sugar changes from fasting levels after four different breakfast regimens

SAMPLING INTERVAL	BRYANT *et al.* (3) VS. PLANT PROTEIN BREAKFAST (df* = 21)		BRYANT *et al.* (3) VS. ANIMAL PROTEIN BREAKFAST (df* = 21)		ORENT-KEILES *et al.* (2) VS. PLANT PROTEIN BREAKFAST (df* = 17)		ORENT-KEILES *et al.* (2) VS. ANIMAL PROTEIN BREAKFAST (df* = 17)		ORENT-KEILES *et al.* (2) VS. BRYANT *et al.* (3) (df* = 14)	
	t value	Significance	t value	Significance	t value	Significance	t value	Significance	t value	Significance
		%		%		%		%		%
Fasting	5.98	0.01	5.04	0.01	22.30	0.01	15.60	0.02	5.48	0.02
30 min.	0.35	80.00	0.84	45.00	0.44	70.00	1.60	70.00	0.48	70.00
60 min.	0.93	40.00	1.74	10.00	2.68	2.00	2.83	2.00	0.19	90.00
90 min.	1.20	25.00	1.06	35.00	—	—	—	—	—	—
120 min.	0.85	45.00	0.80	45.00	0.96	40.00	0.58	70.00	2.14	5.00
150 min.	2.97	1.00	1.48	15.00	—	—	—	—	—	—
180 min.	1.79	10.00	0.78	50.00	0.43	70.00	0.93	20.00	1.31	20.00
210 min.	0.19	85.00	0.52	60.00	—	—	—	—	—	—

* Degrees of freedom.

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Specifications for Equipment

In its recent booklet on standards for *Soda Fountain and Luncheonette Equipment*, the National Sanitation Foundation lists the following *general* specifications for construction and design which are applicable to any food service installation:

SEAMS: All seams resulting from the joining of two or more metal edges in the construction of food storage compartments (ice cream sleeves excepted), work boards (basins excepted), sirup jars, cold food pans, hot food pans, and chipped ice pans shall be made in such a manner that the finished seam is completely closed and smooth. The material used to close seams shall bond to the metal, so that it will not crack or chip off.

RADII: All joints shall be smooth, and shall have a minimum inside radius of 1/16 in.

ANGLES: Angle construction shall not be used where food or garbage may accumulate on ledges or in crevices unless such ledges can be readily inspected, cleaned, and washed.

DRAINAGE INTO TOP OPENINGS: Top openings to unpackaged food storage compartments shall be protected against seepage of condensate, water, and food products.

SLIDING DRAINBOARDS OVER FOOD COMPARTMENTS: A sliding drainboard shall not be installed over a food compartment unless such drainboard is constructed in such a manner as to prevent seepage, or overflow of water or other foreign material into the food compartment.

SPLASH BOARDS: All units of less than counter height shall have splash boards at backs and ends where such units fit against the return ends of counters, and such splash boards shall be sealed water tight to the working surfaces and shall extend to within 1 in. or less of the underside of the counter top slab. All joints shall be smooth and every interior angle shall have a minimum radius of 1/16 in.

REFRIGERANT COILS: Refrigerant coils installed in a food compartment must be either (a) finless types, located where easy and thorough brush cleaning can be carried out, or (b) blower or fin type evaporators, which shall be enclosed in a housing to protect them against spillage of food and to protect food against condensate.

CUTTING BOARDS: Any wood cutting boards used on food preparation units shall be removable, free from cracks and crevices, and have smooth finished surfaces on all sides.

LIDS: Lid assemblies shall be so constructed and installed as to prevent such things as condensate, spilled ice cream, and sirups, from falling into the compartment below. Hinged lids shall be readily removable. Lid assemblies shall be free of cracks and crevices or openings (except for leak-proof and drip-proof hinges) and shall be designed for adequate cleaning and sanitizing.

DRAWERS: All drawers in food service equipment shall be readily removable and every interior angle shall have a minimum radius of 1/16 in.

DISTANCE OFF FLOOR: All food units except creamers and ice cream cabinets shall be built a minimum of 6 in. off the floor.

LEGS AND FEET: Shall be sufficiently rigid to provide support with a minimum of cross bracing, and so fastened to the body of the equipment and so shaped at floor contacts as to prevent the accumulation of dirt and the harborage of vermin. All hollow sections shall be sealed. Where such legs and feet are made adjustable, they shall be of simple design.

REFRIGERATION: Refrigerated storage compartments shall be so equipped and operated as to maintain with the lids open a temperature of not higher than 30°F. when used for ice cream and not higher than 45°F. when used for other foods.

Motivating People to Use Educational Material[1]

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As our understanding of people develops, both through our efforts to render direct service to them and through research in human behavior, it becomes apparent that we, who have chosen as a profession the task of helping people to solve various kinds of personal problems, have an exceedingly difficult job. Our problems seem to arise from several sources, not only from within the client or patient, but also from the environment and from within ourselves. None of these sources of influence remains static. Each is changing and evolving as a result of the pressures and influences on him or it. This, then, makes the task of education, whether it be in the area of safety, nutrition, or family living, both more challenging and more difficult. At the same time, an understanding of the motivations for learning should lead to a more rewarding experience for both the teacher and the student.

Years of effort to impart knowledge to people has proved conclusively that some will learn and some will not. Some will take from the material an entirely different concept from that which was intended. Others will give up and drop out because of boredom or "lack of application of the material." Frequently one hears the complaint that nutritionists are too esoteric and removed from the realities of daily family living to appreciate the problems with which people are faced.

For the most part, the problem does not seem to center in a lack of knowledge of nutrition, but instead in insufficient knowledge and information about human behavior or the people we endeavor to teach. Nutritionists are not alone in this problem. This is the dilemma of education in all fields. If we are to impart our knowledge about nutrition in a usable way, what then must we know about the people we are trying to teach? How can we create a positive climate in which learning can take place at an optimal level?

We must recognize that the adults or children we teach, either directly or through literature of various kinds, have had a series of experiences with foods long before they come in contact with nutrition education. We know that these early experiences have conditioned their attitudes toward foods and have produced the particular set of prejudices, biases, or accepting attitudes, which either block them from understanding or accepting what we have to teach, or actually help them to do so.

This is also true in all other kinds of education. Certainly social workers have ample evidence of the role past experience plays in the individual's ability to accept education in family living. A mother who has been over-protected by her mother may find it difficult and annoying to be told that parental over-protection usually masks negative feelings. It is not surprising if she argues the point or steadfastly maintains that this is the theory of "an expert who has never had children." I must admit that this may appear to be an exaggerated example. It would be hoped that the subject might be dealt with more gently and with more awareness of the situation's anxiety-provoking potentialities, but such statements are printed in a number of pamphlets which have wide distribution among parents.

THE ACCEPTING ATTITUDE

Case workers have learned, too, that people adjust their attitudes through a relationship with an accepting adult who demonstrates a capacity to accept people without judgmental attitudes and who is not fired with a determination to reform. These latter attitudes are overwhelming and frightening to people who have never developed enough self-confidence to evaluate realistically the behavior of others. This, then, suggests the need for nutritionists to lower their educational objectives, at least until a fairly comfortable relationship has been established between the teacher and the group or the individual. During this relationship-building period, an effort should be made to encourage the student or students to talk of their own experiences with foods, to express some of their fixed ideas. During this time they will learn that the teacher is willing and able to accept their ideas as worth while and important because they are theirs, and that she is not determined to change them. If change comes about, it will result from the student's conviction that there is no great danger in experimenting with new ideas, and at the

[1] Presented at the meeting of the Nutrition Council of the Public Health Federation of Cincinnati in May, 1952.

same time that it is acceptable to do things differently from the way mother did them. Lasting change in adults does not take place without the individual being convinced that this is a matter of personal choice and his being free enough within himself to risk it. Thus, if we are to modify these attitudes markedly through our educational efforts, we must understand that people's attitudes toward foods build up from their own life experiences. Unless we learn how to adapt our educational methods and accept the need for a relaxed, warm, and accepting environment in which the motivation for learning or taking from the teacher begins to emerge, we will not succeed. Even under the most auspicious circumstances, some people will be unable to learn.

COMMON ATTITUDES AND FEELINGS

What are the significant attitudes and feelings which people almost universally associate with foods and eating? We know that food is the baby's first need, and that he associates it with the mother who provides it. If the mother's attitudes are warm and loving, the child begins to develop confidence in the fact that his hunger will be satisfied by the mother and that he is a worthwhile person because his mother demonstrates this many times a day. This is the beginning of the child's sense of trust which he will either have or lack, depending on these early feeding experiences, for the rest of his life.

Because we have come to understand the importance in the child's later development of this first experience with food, we are interested particularly in helping young parents understand what feelings the baby associates with his initial nursing period. We know, for example, that the baby needs warmth and affection while he eats, and that inanimate bottle holders do not provide this, even though they are a source of nutrition. We know that the mother's attitude toward breast feeding will convey itself to the infant. Where the mother finds it repulsive or unpleasant for various reasons, it would be better for the infant if she didn't attempt it.

We can say with assurance to parents that it is the mother's attitude toward the baby which will determine how he grows and develops, rather than the type or amount of food he is given. Children who are surrounded with positive and loving attitudes develop better, both emotionally and physically, than those who live in an environment charged with anger, frustration, and unhappiness. It is small wonder that a child develops food whims when the whole eating experience takes place in an environment which holds much uncertainty and lack of security for him. Some children try to substitute satisfactions from food for their lack of satisfaction from affectional relationships. Some learn early that mother's attention can be caught and held through finicky food habits, and this then becomes a way of controlling the situation.

What underlies this behavior is the child's basic need for love, affection, and security from his parents, and particularly from his mother who feeds him. Where such security is lacking, the child often begins to express his fears and doubts in his attitudes toward food. Actually his feelings are toward the parents, but they become displaced to the food—hence the various nutritional problems of adults, with which you as nutrition teachers struggle. Considered in this light, there is little question as to why some problems appear so stubborn and respond so little to our best educational efforts. You cannot undo the damage which was done in the first important relationships, but through understanding the motivations in behavior you can approach the task more realistically and with less need to succeed.

As individuals grow, their past experiences become somewhat blunted. Their feelings about these experiences are pushed down when they realize that these feelings might not be acceptable to other people. This does not mean that the past experience is any less meaningful, but instead that it becomes shadowy, even for the person who experienced it. Sometimes the individual finds it so painful to accept what has happened to him, because he believes that it is undeniable proof of his lack of worth, that he begins to deny, even to himself, that such things ever occurred. These are the adults who protest vigorously that any of their early experiences could have been less than perfect.

Unless such people can be accepted with their vigorous protests and can learn through relations with other people that they will not be thought of less well because they have had some unfortunate and destructive life experiences, they will cling to their denials tenaciously, and all efforts to get them to change or modify will fail. These also are the people who often become uncomfortable in a permissive setting, where it is accepted that all of us are a product of our total life experiences and that we can learn from our failures and need not set such unrealistic goals for ourselves. Sometimes these people must withdraw from an experience which encourages introspection or consideration of how their own attitudes have developed.

GROUP LEARNING SITUATIONS

Every teacher is familiar with the student who seems to drink in information, who accepts everything she says without question, and who forms a very close and clinging relationship with her, almost before the class starts. Sometimes teachers are deluded into regarding such students as apt pupils, just as the school-teacher sometimes overestimates the conforming child. Such people have developed ways of ingratiating themselves with persons in authority, a position which the teacher occupies for them. They find it impossible to differ with any of the material presented, because to do so would con-

stitute, in their opinion, an expression of hostility. We can be certain that such people were never allowed to differ from parents, that they had to accept blindly what mother and father said and stayed in their parents' good graces by so doing. Such persons often become uncomfortable when asked to think aloud or to develop any project spontaneously. They are the passive, receptive learners who can take in indefinitely but who have difficulty giving out.

Other people develop different responses to too much parental control. Instead of submitting quietly to teacher, they fight back and seem to seize on every utterance of the teacher as a subject for argument. In the group they try to demonstrate their ability to differ. Their security somehow rests in their continually demonstrating to themselves that they are no longer controlled. Such a person often responds positively to a teacher who has no great need to be the final authority and who doesn't allow herself to be trapped into verbal quarrels. Gradually the person begins to sense that he is accepted, that the teacher does not regard his differences as personal attacks on her, and that she does not expect to overpower him.

These rather common reactions of group members are cited to point up the fact that each person takes his personality wherever he goes. Thus he brings these reactions to educational sessions just as he does to his job or to his family dinner table. The educator is not a therapist, and her goal is not to help people to gain insight or self-understanding into why they behave as they do. Instead, her goal is to impart knowledge to a group who are motivated by as many different life experiences as there are people in the group. To complicate the matter still further, the educator adds her own particular set of feelings to the situation. In the face of this reality, it seems important for educators to understand something of their own drives, ambitions, and pet hates, if they are not to interfere with the group's learning.

TREAT STUDENTS AS ADULTS

If it is recognized always that people are motivated in many different ways and consequently have different goals, but that people, even with their differences, operate in a fairly satisfactory way most of the time, it seems safe then for the educator or group leader to try to relate herself and her material to the most mature side of the various group members. People, for the most part, respond positively when treated like adults and regard the person who treats them like children as depreciating. Thus it is important that we avoid imparting knowledge in a way which points up wide divergences between the understanding and knowledge of the teacher and those being taught. Even where this is the case, an effort should be made to draw on the experience and thinking of group members in developing the subject.

Ability to contribute to the discussion adds to a person's feeling of adequacy and is an adult way to operate in a group. A teacher with skill in developing group participation finds that her groups often create a more interesting and productive session than she could have produced alone. Also, it is easier for the group to accept new ideas from the teacher if she has already demonstrated her ability to accept their ideas. This essentially is the way in which mutual confidence is built up and is one of the important basic foundations on which learning can take place.

It is true in education for family living that parents have the research laboratory which provides information about children that enables all of us to understand them better. This seems true also in nutrition education where people can report facts about their own experiences with foods which will point up what they see as their needs for information and help and thus provide some reliable guides to us in planning the content of our education. As we gear what we have to contribute to what people feel a need for and can accept, there is a better possibility of our material actually proving beneficial to others. Without this, the material runs the risk of having our professional blessing, but remaining esoteric and lacking in practical application for those who do not share our theoretical knowledge and convictions.

Check Equipment for Good Management

Suitable equipment, located for efficient use and given proper care, provides one of the important means of achieving good management. The questions listed below illustrate the type of question the manager might ask herself:

(a) Is equipment arranged to allow a forward flow of work and prevent retracing steps, cross traffic, and interference with other centers? If not, what rearrangements can be made?

(b) Is equipment kept in good repair and working condition? For example, do stoves and heaters need adjustment to prevent waste of fuel; or do knives need sharpening to restore their efficiency?

(c) Are the lunchroom workers acquainted with the operation of all mechanical equipment, or are some pieces idle because no one knows how to use them?

(d) Would the addition of a few well-chosen pieces of small equipment, such as scoops and ladles, increase the efficiency of preparing and portioning food?

—*From Oscar F. Beyer in Administrative Letter to Cooperating Agencies (January 19, 1953), Production and Marketing Administration, U. S. Department of Agriculture, Chicago.*

Preventing Disease through Food-Service-Personnel Training[1]

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THE late Dr. Milton J. Rosenau, while director of the predecessor of the present National Institutes of Health of the United States Public Health Service, summed up what he believed to be the relationship between food and life in these words (1): "Some of the best medicine is bought in the market, rather than in the drugstore." All of us will agree that this "medicine," like drugs, can cause serious illness and even death, if produced, processed, or served in a questionable environment.

The dietitian, physician, veterinarian, and every other scientist concerned with the safety of human food might well stop for a moment to recall what is being done to *prevent* such tragedies. As professionals working together in this broad field of preventive medicine, we must never lose sight of the fact that ours is not a dramatic program in the true sense of the word. There is drama in a speeding ambulance, icy streets, the grave expression of a surgeon awaiting the arrival of the patient upon whom he is to perform an emergency operation! But where is the drama for you who have prevented an outbreak of typhoid fever through training food-service workers in basic sanitary concepts? No one became ill, there were no emergencies, there were empty hospital beds, there was no glamor! That's one of the difficulties we face in selling our story to the public, which includes the food-service workers themselves. Fortunately, we know that the battle can be won. John Q. Public miraculously escapes food-borne illness on occasions, but he becomes one of our staunchest allies after a bout with "something he 'et' "—or better yet, the "bug" in something he "et."

Most of us consider food-service personnel to include only those who prepare or serve food just prior to consumption. In a broad sense, however, this category must include everyone who comes into contact with food at any point in its migration from farm to home. The prevention of diseases attributable to poultry, for example, would involve vigilance on the poultry farm and a program of sanitation and inspection in the plant, as well as care in cooking and serving. This same principle applies to *every* food industry. For this reason, if we acknowledge that the food-service worker is a key person and that some good can be accomplished through a food-service-personnel training program, we cannot help being impressed by the enormousness of our job.

Various efforts to train food-service workers through formal classroom training have been made periodically by health workers since 1938. In recognition that special guidance was needed in this field, the Public Health Service developed in 1946 the *Guide to Safe Food Service* (2), a manual for use in organizing and conducting classes for food-establishment employees. Health departments and other agencies found it useful during the five years following its publication. It was not long, however, before the need for a detailed plan of instruction for instructors became apparent. This, plus the fact that a considerable amount of visual material and other training aids had been developed in the interim, convinced the Service that a revised publication was needed.

In the summer of 1950, following my transfer from our regional office in Kansas City, Missouri, to the headquarters office in Washington, it was my privilege to be assigned the task of developing such an *Instructor's Guide* (3). At the outset, I felt that the interest in such an endeavor was ubiquitous. There were persons on all levels of government, in many different types of agencies, both official and nonofficial, who were well qualified and willing to assist when specific needs arose. The Preventive Medicine Division of the Navy's Bureau of Medicine and Surgery and the U. S. Office of Education were particularly helpful. The *Guide*, as finally published by the Government Printing Office in April 1952, reflects most of the recommendations and suggestions of reviewing experts throughout the country.

[1] Presented at the 35th Annual Meeting of The American Dietetic Association in Minneapolis, on October 23, 1952.

TOUR OF INTRODUCTION

The methods of instruction stressed in the *Instructor's Guide—Sanitary Food Service* involve the medium of group discussion as opposed to the straight-lecture method. Because of this and other new methods and techniques embodied in the *Guide*, the Navy and the Air Force (both of which have adopted it as an official training manual) and the Public Health Service joined forces in a tour involving twelve major focal points throughout the country, for the purpose of indoctrinating key instructor personnel. Invitations to representatives of military and civilian official and nonofficial health and educational agencies were issued well in advance.

The objectives of the tour were fourfold: (a) to introduce the *Guide* to all possible groups, to show how to use it most effectively in preventing food-borne disease; (b) to provide an opportunity to assemble in a common meeting place top-echelon military and civilian preventive-medical and food-service supervisory personnel, who could then "join minds" for the solution of a common problem; (c) to establish a standard method and approach for training food-service personnel, which is particularly needed since, at present, little uniformity exists in this field; and (d) to stimulate wide interest in preventing food-borne disease, through the use of modern educational methods.

The traveling team of which I was a member was impressed, throughout the tour, by the splendid manner in which the dietetic profession was represented. Dietitians came to all of the meetings on our whistle-stop campaign; many arrived unbroken in spirit after trekking to such out-of-the-way places as Camp Lejeune, North Carolina. Without exception, the contributions of your group to the success of our meetings were outstanding.

We believe that this was the first time that military and civilian agencies have attacked the problem of food-borne disease in nationwide group assemblies. Likewise, these conferences provided the nucleus for the birth of a nationwide, coordinated effort toward better and longer-lasting training in food sanitation for both food workers and the general public. The tour indicated to all who attended the vast difference between two means of presenting new methods—the dogmatic presentation from the headquarters level of a federal agency and a sympathetic approach through which field problems are considered in discussion with field personnel. On those people will fall the responsibility for using the newer methods and materials.

RECOMMENDATIONS

At each of the meetings, groups of delegates voluntarily submitted broad recommendations pertaining to food-sanitation training. I should like to discuss briefly some of the more general recommendations. All seemed to feel that the methods and materials for the training of food-service employees should be standardized throughout the Armed Forces and civilian agencies concerned with such training. Ostensibly, this would mean that a clearing house on the national level would be established for the dissemination of newer techniques, methods, and materials for use in the standardized program.

Education in sanitation, both general and as related to food service, should be extended into the public school systems. Further emphasis should be placed on the general education of the public relative to sanitation and the role of every individual in its maintenance.

It was considered that food-service work should be professionalized through better working conditions, more selective screening of applicants for such work, and increased remuneration for the trained worker. Lest I forget, the *Guide* foregoes the term "food handlers" (one who handles food) in favor of a more descriptive term, "food-service personnel."

A standard certificate or other form of recognition was recommended for all persons completing a standard course in sanitary food-service techniques. Through this practice, it is felt that nationwide reciprocity of training could be established.

The development of new visual aids was urged, and it was stressed that some national agency should take the initiative in stimulating this preparation.

In addition to these items, numerous specific recommendations were proposed, involving the many facets of a food-service-personnel training program:

(a) Continuing to work through national organizations such as The American Dietetic Association and the American Medical Association in disseminating information to the public on the subject of food-borne disease.

(b) Organizing a national conference on food-service education.

(c) Assuring effective instructor training.

(d) Bettering liaison between military and civilian agencies.

(e) Holding a series of courses by the Veterans Administration on methods of training, based on group-discussion methods, which would be included in all dietetic internships.

(f) Requiring food-service operators to pass a minimum examination before receiving a license to operate.

(g) Recognizing that food-service-employee training programs cannot substitute for on-the-spot inspection and employee training.

ORGANIZATION OF THE GUIDE

If we are sincere in our efforts to reduce the all-too-high incidence of food-borne disease, we will have to give additional attention to the human factors involved—food-service workers. This involves training for perfection—preceded, of course, by

recognition of the many problems which face the worker on the job. Thus, in the *Instructor's Guide—Sanitary Food Service* are combined in one volume what would ordinarily constitute several documents.

In brief, Part I of the four-part volume discusses "How to Use the Guide." It stresses that the instructor should, whenever possible, adapt the order of the contents to the needs of a special group. A series of "reminders" directs the attention of the instructor to specific materials and equipment, room arrangements, demonstrations, visual aids, and assistance he will need to conduct the course.

Part II, "How to Conduct This Course," contains many suggestions for grouping the trainees, managing the class, and teaching and testing the trainees.

Eight typical lesson plans are contained in Part III, which is titled "The Guide." Among other things, this portion covers such subjects as an introduction to knowledge of bacteria, food preservation, insect and rodent control, and good housekeeping. The last session of Part III is entitled "Try-Out Performance and Follow-Up." It is intended to emphasize the connection between the food-service training and its application on the job. The follow-up is defined as "any plan used to encourage and help the food-service employees to apply and continue during operations the use of those knowledges, skills, habits, and attitudes, which were the subject matter of instruction in the training sessions."

Part IV of the *Guide*, "Appendices," includes a bibliography and general and selected references by subject and headings. Also included are: a list of publications of the Milk and Food Branch, Division of Sanitation, U. S. Public Health Service; visual-aid guides; pointers for the discussion leader, and factors to be considered in organizing and promoting a food-service-employee training program.

This *Guide* is not a cure-all; it is merely an attempt to offer something concrete to individuals who are given the responsibility for such an activity. The Public Health Service hopes that it will serve your needs well until something better comes along.

The expansion of the food industries, including the large restaurant industry of this nation, has presented new problems in the prevention of food-borne disease. The presence on the market of frozen and dehydrated foods, precooked frozen meals, and packaged mixes of many varieties is particularly significant. I daresay that mass feeding has almost tripled since 1918, and surveys continue to indicate a decreasing ratio of restaurants to persons residing in American cities. What should all of this mean to us? The answer is simple. It means that more persons than ever are coming into contact with food and food products. It means that each new, untrained food-service worker represents a specific link in the chain of food-borne illness. It lends impetus for doing something about the problem.

The brochure issued by your Association, describing the profession of dietetics, leaves me with the impression that the dietitian has established herself firmly as an important public servant. Judging by present world-wide need for experts in the food field who are capable of guiding the impoverished nations of the earth, the dietitian will be a busy person in the years to come. She will probably follow, more closely than ever before, the career of Ellen Henrietta Richards, one of the pioneers in the closely allied field of home economics. As most of you know, it was she who invented a new science and the word for it—euthenics—the betterment of living conditions for all human beings. But then as now, it was recognized that the most nutritious food, no matter how tastefully prepared, if dangerously processed and served, could bring illness and death.

Though we recognize that there are many factors to consider in developing a program to prevent food-borne disease outbreaks, I know you will agree with me that food-service-personnel training stands high on the list of "proven remedies." No one has a greater responsibility or a greater aptitude for developing this type of program than the dietitian.

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Storing Vegetables

Proper storage can prolong vegetable life. In studies of the Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture, eggplants and peppers became pitted when stored for 5 to 8 days at 32° to 40°F., and the eggplants decayed soon after removal to storage. Likewise, the pods of snap beans stored 3 to 5 days at 32°F. became pitted, and those stored at 32° to 40° developed a russet discoloration when moved to room temperature. These same vegetables stored at 50°F. for one week remained in marketable condition longer after removal from storage than those stored at lower temperature.

Another investigation has shown that wilting causes loss of ascorbic acid. Kale, Lima beans, mustard greens, peas, rape, snap beans, spinach, and turnip tops lost more ascorbic acid from wilting when stored at 50° to 70° than samples stored at 31°F.

Thiamine and Riboflavin Retention in Veal[1]

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School of Home Economics, University of Minnesota, St. Paul

VEAL contains sufficient amounts of thiamine and riboflavin to make it a good source of these vitamins if it is cooked by a method which causes little or no destruction. The effect of cooking on the vitamin content has been studied only to a limited extent, however. McIntire *et al.* (1) have reported average thiamine and riboflavin retentions of 40 and 73 per cent, respectively, in braised rib and sirloin steaks and of 57 and 85 per cent in roast leg and shoulder. Drippings furnished an additional 23 and 20 per cent of thiamine and riboflavin, respectively, for the braised steaks and 10 per cent of each for the roasts.

The present paper extends this work to additional cuts of veal. Specifically, it reports the thiamine, riboflavin, fat, and moisture contents of veal loin chops, round steaks, and round roasts before and after cooking and the percentages of thiamine and riboflavin retained in the chops and steaks after braising and in the roasts after roasting.

EXPERIMENTAL PROCEDURE

Four veal short-saddles of U. S. Good grade and two pairs of veal rounds of U. S. Choice quality were obtained from a local packing plant. The saddles were split into right and left sides, each of which was then cut into eight chops approximately $\frac{3}{8}$ in. thick. The chops from one side of each animal were used as a raw sample; the corresponding chops from the other side were braised.

The rounds were cut into steaks and roasts in a manner similar to that used in many retail markets: that is, each was cut into three, $\frac{3}{4}$-in. steaks and one 3-in. roast. (The first steak began at the rump knuckle bone, and the roast ended at the shank knuckle bone.) The six pairs of steaks thus obtained were combined into four pairs of replicate samples as follows. The first steak and half of the second from the same round were combined for Replicate No. 1. The remainder of the second steak (i.e., the bottom round and eye muscles) and the third steak were combined for Replicate No. 2. Replicates 3 and 4 were like No. 1 and 2, respectively, except that they came from the second carcass.

The roast from each round was divided into two samples, one containing the sirloin tip and bottom round and the other the top round and eye muscle. All samples from one side (the right) of the animals were analyzed raw; those from the other side were cooked before being analyzed.

The chops and steaks were braised as follows. Each sample was browned in a slightly greased, heavy iron frying pan, a $\frac{1}{2}$-in. rack slipped under the meat, a small amount of water added (30 ml. for the chops, 59 ml. for the steaks), and the pan tightly covered and set into a moderate oven (150°C. for the chops, 177°C. for the steaks). The chops were cooked for an average of 50 min. per sample (28 min. per pound meat) and the steaks for an average of 38 min. per sample (27 min. per pound meat).

The roasts were cooked as follows. Each was placed on a rack in a shallow pan, a meat thermometer inserted into the center of the largest muscle, the pan placed in an oven at 150°C., and roasting continued until the meat reached an internal temperature of 76.5°C. The average time required was 1 hr. 35 min. per roast (48 min. per pound).

The edible material from each sample was ground and thoroughly mixed, then aliquots were taken for thiamine, riboflavin, fat, and moisture determinations.

Thiamine and riboflavin were determined by the Conner and Straub (2) and the Peterson, Brady, and Shaw (3) methods, respectively. In each case, internal standards formed the basis of calculation. A recovery sample, to which a known amount of thiamine or riboflavin was added before extraction, was run with each determination. The average recovery of thiamine was 95 per cent, with a range of 90 to 103 per cent; that for riboflavin was 99 per cent, with a range of 94 to 105 per cent.

Fat was determined by the method of Oesting and Kaufman (4) and moisture by the difference in weight of several 10-gm. portions before and after drying for 18 hr. at 60°C. and in 28 in. of vacuum.

[1] Scientific Journal Series, Paper No. 2903, Minnesota Agricultural Experiment Station. Received for publication September 22, 1952.

TABLE 1

Thiamine, riboflavin, fat, and moisture content of raw and cooked veal chops, steaks, and roasts

SAMPLE	VEAL CHOPS				VEAL STEAKS				VEAL ROASTS			
	Thiamine	Riboflavin	Fat	Moisture	Thiamine	Riboflavin	Fat	Moisture	Thiamine	Riboflavin	Fat	Moisture
					Raw							
	mg./100 gm.	*mg./100 gm.*	%	%	*mg./100 gm.*	*mg./100 gm.*	%	%	*mg./100 gm.*	*mg./100 gm.*	%	%
1	0.177	0.163	7.6	71.0	0.113	0.192	3.1	73.6	0.110	0.204	4.6	76.5
2	0.150	0.206	1.8	74.4	0.128	0.215	4.1	73.3	0.119	0.197	3.4	73.8
3	0.153	0.226	2.4	73.4	0.134	0.197	4.4	73.7	0.158	0.198	1.7	76.7
4	0.156	0.246	4.0	73.3	0.127	0.197	6.1	73.9	0.148	0.198	1.5	75.4
					Braised							
1	0.114	0.246	10.3	49.0	0.120	0.328	3.6	54.0	0.118	0.266	3.6	66.6
2	0.114	0.323	7.4	55.0	0.105	0.328	10.2	49.9	0.114	0.296	3.6	65.6
3	0.105	0.323	8.2	54.5	0.129	0.295	11.2	48.2	0.164	0.263	6.6	67.1
4	0.099	0.390	10.9	53.3	0.122	0.262	10.2	53.0	0.142	0.263	7.1	64.1

RESULTS

Vitamin, Fat, and Moisture Values

The thiamine, riboflavin, fat, and moisture contents of the veal chops, steaks, and roasts are given in Table 1. The average thiamine values were 0.140 mg. per 100 gm. raw meat and 0.120 mg. per 100 gm. cooked meat. The corresponding riboflavin averages were 0.203 mg. per 100 gm. raw and 0.307 mg. per 100 gm. cooked meat. These values are all slightly lower than those given by McIntire *et al.* (1). The average fat content was 3.7 per cent for the raw and 7.7 per cent for the cooked samples. The corresponding values for the moisture were 74.1 and 56.7 per cent. The fat was somewhat lower and the moisture somewhat higher in the raw meat than is given in *Tables of Food Composition* (5). This difference was probably due to a difference in the trimming of the exterior layer of fat.

The cooked meat furnished the following proportions of the daily allowance of thiamine and riboflavin recommended by the Food and Nutrition Board for a 70-kg. physically active man: braised chops, 4 per cent of the thiamine and 11 per cent of the riboflavin; braised round steaks, 4 per cent of the thiamine and 9 per cent of the riboflavin; and roasted round, 7 per cent of the thiamine and 11 per cent of the riboflavin. A serving contained a 4-oz. edible portion when raw.

Vitamin Retention

The percentage retentions of thiamine and riboflavin in the cooked samples of the veal chops, steaks, and roasts are given in Table 2. These values were calculated from the quantities of the vitamins present in the entire sample that was cooked. (For the weights of the samples, see Columns 12 and 13 of Table 2.) The percentage retentions were calculated also on the basis of the quantities of these vitamins present in the dry, fat-free solids. The results obtained were not significantly different from those reported in Table 2.

The method of cooking made a significant difference in the retention of both thiamine and riboflavin in the cooked meat. The roasts consistently retained greater percentages of both thiamine and riboflavin than did the braised cuts. Of the latter, the steaks retained a greater proportion of the thiamine, but less of the riboflavin originally present than did the chops. The average retentions for the roasts were 67 and 91 per cent; for the braised steaks, 48 and 76 per cent; and for the braised chops, 34 and 84 per cent, respectively, of the thiamine and riboflavin present in the raw meat.

The percentages of thiamine and riboflavin dissolved in the cooking liquids are also given in Table 2. As may be noted from the table, the drippings from the roasts averaged an additional 20 per cent of thiamine and 13 per cent of riboflavin, and the cooking liquids from the steaks and roasts an additional 33 and 17 per cent, respectively, of thiamine and 24 and 17 per cent of riboflavin. Thus, the roasts plus the drippings from them contained only a slightly greater proportion of the original thiamine than the steaks plus their cooking liquids, but they contained a considerably greater proportion than the chops plus their cooking liquids. In all cases, the total riboflavin retention was within experimental error of 100 per cent.

SUMMARY

The thiamine and riboflavin contents of four replicate samples of veal loin chops, round steaks, and round roasts were determined fluorometrically before and after braising the chops and steaks and before and after cooking the roasts.

The average thiamine and riboflavin contents of

TABLE 2

Thiamine and riboflavin retention in braised veal chops and round steaks and roasted veal round

SAMPLE	THIAMINE					RIBOFLAVIN					WEIGHT OF MEAT		
	In meat			In cooking liquid		In meat			In cooking liquid				
	Before cooking	After cooking	Retention	Quantity	Retention	Before cooking	After cooking	Retention	Quantity	Retention	Before cooking	After cooking	Loss
Braised Chops													
	mg./sample	*mg./sample*	%	*mg./sample*	%	*mg./sample*	*mg./sample*	%	*mg./sample*	%	*gm./sample*	*gm./sample*	%
1	1.258	0.433	34	0.198	16	1.159	0.935	81	0.155	13	711	380	47
2	0.891	0.356	40	0.213	24	1.224	1.008	82	0.279	23	594	312	47
3	0.926	0.376	41	0.160	17	1.367	1.156	85	0.310	23	605	358	41
4	1.556	0.347	22	0.192	12	1.601	1.369	86	0.161	10	651	351	46
Mean.....			34		17			84		17			45
Braised Round Steaks													
1	0.640	0.318	50	0.254	40	1.092	0.872	80	0.325	30	568	266	53
2	0.642	0.250	39	0.174	27	1.077	0.783	73	0.268	25	501	239	52
3	0.990	0.494	50	0.242	24	1.455	1.126	77	0.300	21	737	418	43
4	1.029	0.546	53	0.432	42	1.599	1.169	73	0.290	18	810	486	40
Mean.....			48		33			76		24			47
Roasted Round													
1	0.847	0.638	75	0.052	6	1.578	1.433	91	—	—	773	539	30
2	1.042	0.679	65	0.129	12	1.727	1.761	102	0.261	15	875	594	32
3	1.538	1.031	67	0.370	24	1.927	1.657	86	0.257	13	975	629	36
4	1.355	0.824	61	0.495	36	1.813	1.526	84	0.197	11	918	580	37
Mean.....			67		20			91		13			34

the raw samples were 0.140 mg. and 0.203 mg. per 100 grams.

The method of cooking made a significant difference in both thiamine and riboflavin retention. The braised chops retained approximately one-third of the thiamine and seven-eighths of the riboflavin present in the raw samples. The braised steaks retained about one-half and three-fourths and the roasts about two-thirds and nine-tenths, respectively, of the original thiamine and riboflavin.

One serving (that is, an edible portion weighing 4 oz. when raw) of the cooked chops, steaks, and roasts furnished the following percentages of the daily allowance for thiamine and riboflavin recommended by the Food and Nutrition Board for a 70-kg. physically active man: the chops, 4 and 11; the steaks, 4 and 9; and the roasts, 7 and 11 per cent, respectively.

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(1) McIntire, J. M., Schweigert, B. S., and Elvehjem, C. A.: The retention of vitamins in veal and lamb during cooking. J. Nutrition 26: 621, 1943.

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(4) Oesting, R. B., and Kaufman, I. P.: Rapid determination of fat in meat and meat products. Indust. & Engin. Chem., Anal. Ed. 17: 125, 1945.

(5) Bureau of Human Nutrition and Home Economics in cooperation with National Research Council: Tables of Food Composition in Terms of Eleven Nutrients. U.S.D.A. Misc. Pub. No. 572, 1945.

Animal vs. Vegetable Fats to be Studied

At the University of Minnesota, a new investigation is getting underway to study the physiologic effects of butterfat and of vegetable fats. The research will be coordinated by three departments—Dairy Husbandry, Agricultural Biochemistry, and Veterinary Medicine.

The investigation will follow up recent reports that dairy calves fed whole milk enjoyed normal growth while those fed various vegetable oils homogenized with skim milk were dead within a few weeks. Heart lesions and muscle dystrophy, described as symptoms similar to vitamin E deficiency, were observed in calves fed corn oil instead of butterfat.

Editorial

REPORT OF THE NOMINATING COMMITTEE, THE AMERICAN DIETETIC ASSOCIATION, 1952–53[1]

The Nominating Committee of The American Dietetic Association—Helen Baughman, Anna M. Tracy, Winifred Howard Erickson, Louise Esch, and Wilma F. Robinson, Chairman—presents the following ballot for 1953–54:

PRESIDENT-ELECT

Fern W. Gleiser: B.S., University of Washington, Seattle; M.S., Teachers College, Columbia University

Positions held:
- Assistant Manager of Commons, University of Washington, Seattle
- Assistant Director of Residence Halls and Manager of Tea Room, Oregon State College, Corvallis
- Instructor in Institution Administration, Teachers College, Columbia University
- Assistant Professor, Institution Administration, Drexel Institute, Philadelphia
- Professor and Head of Institution Management, Iowa State College, Ames
- Since 1944—Professor of Institution Economics and Management, University of Chicago, School of Business

Professional activities:
- Speaker, House of Delegates, A.D.A.
- Treasurer, A.D.A.
- Delegate-at-Large, A.D.A.
- Delegate, A.D.A.
- Member: Finance Committee, Nominating Committee, Administrative Approval Committee; Special Committee on Professional-Economic Status of the Dietitian, A.D.A.
- President, Iowa Dietetic Association
- Vice-President, Illinois Dietetic Association
- Member: University of Chicago-National Restaurant Association Education Committee
- Member: Omicron Nu; Phi Upsilon Omicron; Beta Gamma Sigma; and Delta Kappa Gamma

Publications:
- Articles in this JOURNAL and other professional publications

SPEAKER-ELECT OF THE HOUSE OF DELEGATES

Cora E. Kusner: Diploma, Battle Creek (Mich.) College

Positions held:
- Assistant Dietitian, Children's Fresh Air Camp and Hospital, Cleveland
- Since 1924—Dietitian, Colorado State Hospital, Pueblo
- Present position—Director of Dietetics and Director of Approved Dietetic Internship, Colorado State Hospital, Pueblo

Professional activities
- Chairman, Food Administration Section, A.D.A.
- Chairman, Publications Committee, A.D.A.
- Delegate, A.D.A.
- Chairman, A.D.A. Committee to cooperate with the American Psychiatric Association in formulating food standards for mental hospitals, 1951
- Member: Joint Committee of the American Hospital Association and A.D.A.

Publications:
- Articles in this JOURNAL and in hospital publications

Mary Reeves: B.S., Tarkio (Mo.) College; Graduate work, University of Chicago; M.P.H., Harvard University

Positions held:
- Staff Dietitian, Presbyterian Hospital, Chicago
- Staff Dietitian, California Lutheran Hospital, Los Angeles
- Dietitian, Board of Education, Long Beach, California
- Community Nutritionist, St. Joseph, Missouri
- Public Health Nutritionist, Missouri Division of Health
- Present position—Regional Nutrition Consultant, Children's Bureau, Federal Security Agency, Chicago

Professional activities:
- Chairman, Community Nutrition Section, A.D.A.
- Chairman, Educational Exhibits Committee, A.D.A.
- Delegate, A.D.A.
- President-Elect, Missouri Dietetic Association

TREASURER

Doris T. Odle: B.S., Purdue University, Lafayette, Indiana; M.S., Kansas State College, Manhattan

Positions held:
- Assistant Chief Dietitian, Presbyterian Hospital, Denver
- Chief Dietitian, Presbyterian Hospital, Denver
- Assistant Manager, Tea Room, Kansas State College, Manhattan
- Chief Dietitian, University of Colorado Department of Medicine (Colorado General Hospital), Denver

Professional activities:
- Convention Chairman, A.D.A.
- Delegate, A.D.A.
- Chairman, Joint Committee of the American Hospital Association and A.D.A.
- Chairman, Section Projects, A.D.A.
- President: Colorado Dietetic Association, Denver Dietetic Association

Publications:
- Papers in this JOURNAL and in *Hospitals*

Eva N. Ylvisaker: B.S., University of Cincinnati; dietetic internship, University of Minnesota Hospitals, Minneapolis

Positions held:
- First Assistant Dietitian, University Hospital, Minneapolis
- Acting Head Dietitian, University Hospital, Minneapolis
- Since 1928—Head Dietitian, Children's Hospital, Cincinnati

[1] Other nominations may be made by nomination petitions signed by not less than 400 members of the Association, of whom not more than 30 shall be from any one state, assented to in writing by the person or persons named thereon as nominees, and filed with the Secretary at the office of the Association on or before April 15, 1953.

At present—Special Lecturer, College of Nursing and Health, University of Cincinnati
Professional activities:
Co-Chairman, Vocational Guidance Committee, A.D.A.
Convention Chairman, A.D.A.
Chairman, Section Project, A.D.A.
A.D.A. Representative on the Advisory Committee on Maternal and Child Health and Crippled Children's Services, U. S. Children's Bureau

DELEGATES-AT-LARGE

The following (two of whom are to be elected) have been selected as candidates for Delegate-at-Large:

Mildred Bonnell: B.A., University of Illinois, Urbana; M.A., Teachers College, Columbia University
Positions held:
Manager, Food Shop, Rockford (Ill.) Woman's Club
Assistant Dietitian, University of Chicago Clinics
Building Consultant, Residence Hall Manager, and Instructor, University of Illinois, Urbana
Industrial Feeding Specialist, War Food Administration, U. S. Department of Agriculture, Dallas
Consultant Dietitian, United Nations Relief and Rehabilitation Administration and United Nations, Chungking and Nanking, China
Present position—Assistant Director, University Dining Halls, and Acting Assistant Professor, University of Washington, Seattle
Professional activities:
Member, JOURNAL Board, A.D.A.
Delegate, A.D.A.
Chairman, Committee on Assistance to Libraries in Foreign Countries, A.D.A.
Member: Convention Program Planning Committee, Advisory Committee on Foreign Students, A.D.A.
President: Illinois Dietetic Association, Washington State Dietetic Association
Publications:
Papers in this JOURNAL, *Stewards Magazine*, and *Hospital Management*

R. Alberta Hughes: B.S., Bradley University, Peoria, Illinois; M.S., State University of Iowa, Iowa City; dietetic internship, Indiana University Medical Center, Indianapolis
Positions held:
Dietitian, Galesburg (Ill.) Cottage Hospital
Cafeteria Manager, Manual Training High School, Peoria
Dietitian, Peoria State Hospital
Administrative Dietitian, Good Samaritan Hospital, Cincinnati
Director of Dietetics, St. Marys Hospital, Detroit
Director of Nutrition Service, Peter Bent Brigham Hospital, Boston
Present position—Instructor in Dietetics, Veterans Administration Medical Teaching Group Hospital, Memphis
Professional activities:
Delegate, A.D.A.
Chairman, Section Projects, A.D.A.
Secretary: Massachusetts Dietetic Association, Tennessee Dietetic Association
Publications:
Articles in this JOURNAL

Margaret A. Ohlson: B.A., State College of Washington, Pullman; M.S., Ph.D., State University of Iowa, Iowa City
Positions held:
Executive Dietitian, Washington Veterans Home, Retsil, Washington
Therapeutic Dietitian, Sacred Heart Hospital, Spokane
Instructor in Nutrition, Indiana University Hospitals, Indianapolis
Assistant Professor, Department of Foods and Nutrition, Michigan State College, East Lansing
Associate Professor, Department of Foods and Nutrition, Iowa State College, Ames
Present position—Professor and Head, Department of Foods and Nutrition, Michigan State College, East Lansing
Professional activities:
President, A.D.A.
Secretary and Chairman, Membership Committee, A.D.A.
Secretary, Investigation Board, A.D.A.
President, Iowa Dietetic Association
Member, Food and Nutrition Board, National Research Council
Dietetic Consultant, Air Force Medical Service
Publications:
Author, *Laboratory Handbook for Dietetics*
Papers in this JOURNAL and other professional publications

Lillian M. Reiner: B.S., Cornell University; M.A., Columbia University; dietetic internship, Montefiore Hospital, New York City
Positions held:
Assistant Dietitian, Therapeutic Dietitian, and Assistant Chief Dietitian, Montefiore Hospital, New York City
Chief Dietitian, West Jersey Homeopathic Hospital, Camden
Present position—Director of Dietetics and Dietetic Internships, Beth Israel Hospital, Boston
Professional activities:
Delegate, A.D.A.
President, Massachusetts Dietetic Association
Vice-President, New Jersey Dietetic Association
Treasurer, Greater New York Dietetic Association
Publication:
Article in *Modern Hospital*

NOMINATING COMMITTEE

The following candidates (five of whom are to be elected) for the Nominating Committee for 1953–54, have been selected as representatives of five geographic areas determined on the basis of distribution of the membership. Members are to vote for one person from each geographic area.

Geographic Area I[2]

Doris Johnson: B.S., M.S., Ph.D., University of Wisconsin; dietetic internship, The Johns Hopkins Hospital, Baltimore
Positions held:
Dietitian, St. Joseph's Hospital, Milwaukee
Research Assistant, Department of Home Economics, University of Wisconsin
Dietitian, Wisconsin State Sanatorium, Stateson
Dietitian, Edward J. Hines Memorial Hospital, Hines, Illinois

[2] Geographic Area I: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, and Pennsylvania.

Ward Supervisor and Teaching Dietitian, Presbyterian Hospital, New York City
Present position—Director of Dietetics, Grace-New Haven Community Hospital, and Assistant Professor, Yale University School of Medicine, New Haven, Connecticut
Professional activities:
Chairman, JOURNAL Board, A.D.A.
Chairman, Diet Therapy Section, A.D.A.
Chairman, Committee on Diabetic Diet Calculations, A.D.A.
Chairman, Diet Therapy Section, Connecticut and New York State Dietetic Associations
Chairman, Food Administration Section, Wisconsin Dietetic Association
Publications:
Author: *Modern Dietetics*
Overweight Is Curable
A Laboratory Manual in Cookery
Papers in this JOURNAL and other professional publications

Anna M. Light: B.S., and Ph.D., Pennsylvania State College, State College; M.A., Teachers College, Columbia University; dietetic internship, Pennsylvania Hospital, Philadelphia
Positions held:
Dietitian, Reading (Pa.) Hospital
Dietitian, Harrisburg (Pa.) Hospital
Dietitian and Instructor, Indiana University Medical Center, Indianapolis
Assistant Director, Department of Dietetics, University Hospital, and Instructor in Dietetics, Department of Internal Medicine, University of Michigan Medical School, Ann Arbor
Associate Professor, Department of Home Economics, New York University, New York City
Present position—Chairman and Professor, Department of Home Economics, University of New Hampshire, Durham
Professional activities:
Chairman, Section Projects, A.D.A.
Chairman, Diet Therapy Section, New Hampshire Dietetic Association

Geographic Area II[3]

Clara E. Childress: B.S., Woman's College, Furman University, Greenville, South Carolina; M.A., Columbia University
Positions held:
Assistant Dietitian, Long Island Hospital, Brooklyn, New York
Assistant Dietitian, Duke University Hospital, Durham, North Carolina
Dietitian, Martha Jefferson Hospital, Charlottesville, Virginia
Dietitian, Presbyterian Hospital, New York City
Dietitian, U. S. Army
Present position—Chief, Education Section, Dietetic Division, Veterans Administration, Washington, D. C.
Professional activities:
Delegate-at-Large, A.D.A.
Member, Finance Committee, A.D.A.
Chairman, Section Project, A.D.A.
Publications:
Papers in this JOURNAL

[3] Geographic Area II: New Jersey, Delaware, Maryland, Washington, D. C., Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, West Virginia, Tennessee, Kentucky, Arkansas, and Louisiana.

Frances A. Halbert: B.S., Mississippi State College for Women, Columbus; Graduate work, Teachers College, Columbia University; dietetic internship, Barnes Hospital, St. Louis
Positions held:
Assistant Dietitian, Spartanburg (S. C.) General Hospital
Assistant to Dietary Director in Charge of Administration, Touro Infirmary, New Orleans
Present position—Director of Dietary Services, Hotel Dieu Sister's Hospital, New Orleans
Professional activities:
Delegate, A.D.A.
Member: Public Relations Committee, State Associations Committee, A.D.A.
President, Louisiana Dietetic Association
Vice-President, New Orleans Dietetic Association

Geographic Area III[4]

Adelia M. Beeuwkes: B.S., Michigan State College, East Lansing; M.S., University of Michigan, Ann Arbor
Positions held:
Therapeutic Dietitian, University Hospital, Ann Arbor
Therapeutic Dietitian, New York Hospital, New York City
Therapeutic Dietitian, Presbyterian Hospital, New York City
Nutritionist, University Health Service, Ann Arbor
Instructor in Nutrition, Division of Hygiene and Public Health, University of Michigan, Ann Arbor
Instructor in Dietetics, University of Michigan Medical School, Ann Arbor
Present position—Associate Professor of Public Health Nutrition, University of Michigan School of Public Health, Ann Arbor
Professional activities:
Chairman, Community Nutrition Section, A.D.A.
Chairman, Program Advisory Committee, A.D.A.
Member, JOURNAL Board, A.D.A.
Member, History of Nutrition Committee, A.D.A.
President: Michigan Dietetic Association, Ann Arbor Dietetic Association
Publications:
Papers in this JOURNAL and other professional publications

Helen Mallory: B. A., University of Akron; dietetic internship, Lakeside Hospital, Cleveland
Positions held:
Dietitian, Peoples Hospital, Akron
Head Dietitian, Mount Sinai Hospital, Cleveland
Present position—Director of Dietetics and Dietetic Internship, University Hospitals of Cleveland
Professional activities:
Delegate, A.D.A.
Member, Constitution Committee, A.D.A.
President: Ohio Dietetic Association, Cleveland Dietetic Association
Publication:
Article in *Hospitals*

Geographic Area IV[5]

Lillian O. Fried: B.S., State College of Washington, Pullman; dietetic internship, Cook County Hospital, Chicago

[4] Geographic Area III: Michigan, Ohio, Indiana, and Illinois.

[5] Geographic Area IV: Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas.

Positions held:
Dietitian, Kessler-Hatfield Hospital, Huntington, West Virginia
Dietitian, Department of Public Welfare, New York City
Director, Roble Hall, Stanford University, California
Assistant Director, Dormitories and Commons, University of Wisconsin, Madison
Present position—Director, Ann Emery Hall, Madison
Professional activities:
Chairman, Public Relations Committee, A.D.A.
Chairman, Vocational Guidance Committee, A.D.A.
Delegate, A.D.A.
President: Wisconsin Dietetic Association, Madison Dietetic Association

Ruth Nickel: B.S., St. Mary's College, Notre Dame, Indiana; dietetic internship, Michael Reese Hospital, Chicago
Positions held:
Relief Dietitian, Grand View Sanatorium, Ironwood, Michigan
Head Dietitian, St. Joseph's Infirmary, Houston, Texas
Present position—Dietitian, St. Marys Hospital, Rochester, Minnesota
Professional activities:
Co-Chairman, Convention Committee, A.D.A.
Delegate, A.D.A.
President: Minnesota Dietetic Association, Rochester (Minn.) Dietetic Association

Geographic Area V[6]

Margaret Cowden Bernard: B.S., University of Nebraska; dietetic internship, Michael Reese Hospital, Chicago

[6] Geographic Area V: Hawaii, Washington, Oregon, California, New Mexico, Arizona, Idaho, Utah, Nevada, Montana, Wyoming, and Colorado.

Positions held:
Dietitian, Children's Hospital, Pittsburgh
Therapeutic Dietitian, Vanderbilt University Hospital, Nashville
Chief Dietitian, Children's Memorial Hospital, Chicago
Chief Dietitian, Michael Reese Hospital, Chicago
Chief, Dietetics Division, Branch Office, Veterans Administration, Denver
Present position—Clinic Dietitian, Veterans Administration, Denver, and homemaker
Professional activities:
Treasurer, A.D.A.
Co-Chairman, Convention Committee, A.D.A.
Delegate, A.D.A.
Member, Council of the House of Delegates, A.D.A.
Member, Approval Committee, A.D.A.
President: Colorado Dietetic Association, Illinois Dietetic Association
Publications:
Co-author, *Food in Health and Disease*
Author, *The Hospital Dietary Department*

Juanita I. Kahler: B.S., University of Colorado; M.S., Kansas State College
Positions held:
Manager, College Co-operative Feeding Unit, Kansas City College, Manhattan
Instructor in Institution Management, Ohio University, Athens
Present position—Assistant Dean, College of Home Economics, and Associate Professor of Institutional Economics, Washington State College, Pullman
Professional activities:
Delegate, A.D.A.
President and Vice-President, Washington State Dietetic Association
Publication:
Article in *Forecast for Home Economists*

Effect of Baby Foods on Teeth

Research indicating that a baby's formula is an important factor in determining whether he has good teeth in later life was reported at the American Chemical Society's Southeastern Regional Meeting in October in Auburn, Alabama.

Both permanent and "baby" teeth are being formed while the infant is on his bottled formula, explained Howard C. Elliott, Dr. Ward Pigman, and Sidney B. Finn, of the University of Alabama Dental School and Medical College. "If the usual 'baby foods' will facilitate dental decay, at that time or in later life, this should be an important consideration influencing the formulation of infant diets by pediatricians."

To study the effect of a common infant formula on tooth decay, the chemists fed laboratory hamsters a diet made of whole milk powder and a commercial starch product, together with a vitamin mixture, in the usual proportions for infant feeding. Similar diets were given to other groups of hamsters, but the amount and nature of carbohydrate material, such as sugar and starch, were altered.

While the hamsters given the simulated infant formula had relatively small amounts of tooth decay, extensive decay was found in animals fed diets unusually rich in starch and table sugar. From this evidence, it was concluded that the simulated formula "appears to be relatively satisfactory for use in infant diets from the standpoint of the health of the teeth." Obviously, however, other common formulas based on different types of carbohydrates such as glucose sirups may not be satisfactory and must be studied separately. In any case, the results are incomplete in that the effect of vitamin supplements is not known, and it would also be desirable to have studies in which the hamsters would be subjected to these diets during the entire period of tooth formation.

Current Comment

ARE OUR HOSPITAL DIETS THERAPEUTIC?

"Dietary practices in hospitals have not kept up with the recent advances in the field of therapeutic nutrition. The majority of therapeutic diets outlined in the various hospital manuals, including the military, do not supply the nutrients necessary to maintain good nutrition during the acute phase of an illness, and insufficient attention is given the extra requirements for the convalescent and rehabilitation phase of medical care.

"It is current practice to calculate the hospital diet on the basis of the nutritional requirements of healthy individuals and to neglect the additional demands created by disease. When therapeutic or special diets are prescribed, the attention commonly is focused so sharply on the treatment of the specific symptoms that the diet desired is allowed to become nutritionally inadequate. The responsibility for this situation rests not only on the dietitian, nurse, and hospital attendants but directly on the physician."

This indictment serves as a part of the introduction to the new report, *Therapeutic Nutrition*,[1] of the National Academy of Sciences—National Research Council. It was prepared by Herbert Pollack and Seymour L. Halpern with the collaboration of the Committee on Therapeutic Nutrition of the Food and Nutrition Board. Support for these statements comes from the surveys and observations of Bensley *et al.* (1), Browne (2), and Duncan (3).

Two new and important reports have been released by the National Academy of Sciences—National Research Council. Because they merit thoughtful consideration by dietitians, the entire Current Comment Section of the *Journal* this month is devoted to comprehensive reviews of these reports.

The first review—that of *Therapeutic Nutrition* — will spotlight for the dietitian some of the places where greater vigilance can be extended in planning and serving therapeutic diets. In the second publication, which is a review of extant literature on dental caries, the dietitian will find much of value in promoting better normal nutrition.

If you, as a dietitian, have been planning to increase the nutrient content of the liquid, soft, and bland diets used in preoperative, postoperative, and peptic ulcer regimens, for example, you will find incentive and support for such action in this report. Acutely ill, injured, and surgical patients are subject to rapid nutritional degradation. Emphasis in this report is placed primarily on recovery from acute catabolic episodes that produce drastic metabolic derangement. Prolonged, partial, or chronic malnutrition is not of primary concern in this publication.

The following excerpts, taken from the sections "Nutritional Requirements of the Sick, Injured, and Convalescent" and "Therapeutic Nutrition for Specified Conditions," point up some tentative goals for nutritional allowances in disease.

SPECIAL GOALS

CALORIES

Weight loss is *not* an inevitable result of disease or injury and usually can be minimized by sufficient attention to nutrition. The average afebrile adult patient with minor injury or illness can be maintained in caloric balance at bed rest by a total caloric intake of about 2000 calories per day. Severe injury or illness may increase the needs to a level of 2500 to 4000 calories per day. If the patient has been previously severely depleted, nutritional repletion with an intake of 3500 or more calories per day is desirable. Where severe chills occur in addition to fever, as in malaria, the patient may expend up to 5000 calories in 24 hr.

Many "therapeutic" diets are inadequate in their caloric content, e.g., standard postoperative routine diets and the first ten days of the Sippy regimen for the treatment of peptic ulcers. These therapeutic diets should be revised to make them nutritionally adequate. More research is necessary to determine the actual minimum caloric allowance which will permit the effective utilization of other nutrients and assist or promote a rapid, uncomplicated convalescence.

PROTEIN

The bed patient requiring more then ten days' hospitalization may have had sufficient metabolic insult to result in a protein "catabolic phase" with its concomitant nitrogen losses. Patients losing formed protein (from burns, exudates, ascites, renal disease) and those not forming sufficient protein (hepatic disease) also may require increased amounts.

Patients who undergo surgery should, when possible, receive protein both preoperatively and postoperatively. About 150 gm. per day are indicated.

[1] Therapeutic Nutrition. By Herbert Pollack and Seymour Lionel Halpern. Publication No. 234. Washington, D. C.: National Academy of Sciences—National Research Council, 1952. Paper. Pp. 94. Price $1.

Add Flavor-Appeal to a Nourishing Meal

VEGETABLE CHOWDER

(FOR 50)

Butter or other shortening	1 cup (½ lb.)
Flour	1 cup (4 ozs.)
Boiling water	1½ gallons
Shredded cabbage	4 quarts (1 lb. 10 ozs.)
Diced carrots	2 quarts (2 lbs. 2 ozs.)
Finely cut onions	1½ quarts (3 lbs.)
Salt	5 tablespoons
Pepper	1 teaspoon
Pet Milk	16 cups*
Drained peas, freshly cooked or canned	2 quarts (see note)
Finely cut parsley (optional)	½ cup

Melt butter. Blend in flour. Stir until brown. Stir in boiling water slowly. Add cabbage, carrots, onions, salt and pepper. Boil, uncovered until vegetables are tender. Then add milk, drained peas and the parsley. Heat thoroughly, but do not boil. Serve at once. Makes 50 servings of a little over 1 cup each.

Note: If canned peas are used, you'll need 4 No. 2 cans or ½ of a No. 10 can.

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This should be started as soon as feasible, consistent with the clinical status of the patient. It is much simpler to prevent a protein deficiency than to correct it.

Maximum efficiency of tissue synthesis is found with a protein intake of 2 to 4 gm. per kilogram per day. For routine hospital use, the physician will find that diets furnishing 2 gm. protein per kilogram of body weight will satisfy most conditions.

VITAMINS

It is important to remember that the vitamins must be considered, not as independent nutrients, but as actual participants in metabolic reactions. Disease or tissue injury may cause a break in the chain of reactions yielding the energy required for the formation of co-enzymes. Thus, in spite of a normal amount of vitamins, the actually functioning co-enzyme could not be synthesized.

Thiamine-Calorie Relationship

The thiamine requirement is related to the caloric composition. It is probably further influenced by the percentage of carbohydrate in the diet. A liberal allowance of thiamine is advisable when patients are receiving glucose intravenously. Thiamine deficiency is occasionally precipitated during the refeeding of starved individuals. The increased caloric and carbohydrate intake sharply increases the body demands for thiamine. When oral antibiotics are given, thiamine requirements, as well as those of the other B-complex vitamins, may be increased due to interference with biosynthesis of this vitamin. The severely diseased and injured who have had no obvious serious depletion should receive about 5 mg. thiamine daily in the diet. When a definite depletion exists, as indicated by an inadequate previous diet, indicative signs of deficiency, or very low concentration of thiamine in the urine, 10 to 25 mg. thiamine per day may be given for the first seven to ten days, to be followed by a maintenance dose of 5 mg. daily until convalescence is well advanced.

Riboflavin, Niacin, and Protein

There is a relationship between riboflavin retention and excretion and protein metabolism. It is not clear whether riboflavin needs increase with caloric consumption in a manner similar to thiamine. Minor illnesses and injuries not accompanied by any interference in food consumption should not significantly alter riboflavin requirements. After a severe injury, illness, or burn, however, requirements may be increased five to ten times. Such patients should, therefore, receive 10 to 15 mg. riboflavin daily during the acute phase and early convalescence.

Niacin requirements in health and disease are related to the protein intake. Not much is known about the metabolism of niacin in stress situations. It has been suggested that following severe injuries, infections, and burns, the metabolism of niacin is altered as is that of other members of the B-complex. During the acute phase of the illness and also in the early period of convalescence, at least 30 to 100 mg. niacinamide should be given.

Other Vitamins

Although there is a considerable fund of knowledge on ascorbic acid balance in disease, further research is desirable on the nature of the alterations in ascorbic acid metabolism. After severe burns, the blood ascorbic acid concentration and the urinary excretion may fall rapidly almost to zero. The very low plasma ascorbic acid levels in severe stress are probably not due to pre-existing deficiency, to failure of absorption, to excretion in the sweat, to secretion in exudates, or to storage, but most likely to increasing utilization. As much as 1 to 2 gm. ascorbic acid daily during the acute stage of stress and 300 mg. daily thereafter is recommended.

The National Research Council's recommendation for vitamin A is 5000 I.U. daily for a normal adult. Short-term illnesses probably do not require any supplementary vitamin A except in hepatic disease where storage or availability may be less than normal. It recently has been demonstrated that the vitamin A content of the blood may be lowered in severe acute illnesses. This may indicate some increased utilization of the vitamin, or interference with conversion of carotene into vitamin A, or failure of liberation from the liver. When daily vitamin supplements are being given, it is suggested that 5000 I.U. vitamin A be included. Larger amounts are unnecessary, and extremely large dosages may produce undesirable side effects.

Recommendations are also made for other vitamins and electrolytes.

AIMS IN CONVALESCENCE AND DISEASE

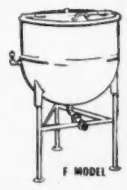
GENERAL SURGICAL AND POSTOPERATIVE PATIENTS

The insufficient caloric and protein content of the routine postoperative feeding schedules and of the liquid, soft, and bland diets commonly prescribed is an insult superimposed on the loss of nitrogenous substance which usually follows surgical procedures. Fluid balance should be maintained and prophylaxis against nutritional depletion started during the first 24 hr. after a major operative procedure.

After gastric operations, a full intravenous feeding schedule is followed the first few days and gradually reduced as oral feeding is resumed. For most other types of gastrointestinal operations, such as cholecystectomies and combined abdomino-perineal resections, oral feedings are usually resumed earlier.

A sample schedule is as follows: On the day of operation, all necessary transfusions and the full intravenous feeding are given. In addition, on the

hospitals, too....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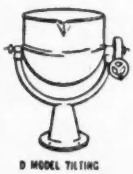
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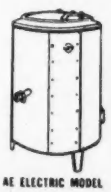
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first postoperative day, small amounts of liquids without milk or fruit juice are given *ad libitum*. On the second day, liquids, including skim milk and fruit juices, and small portions of cereals or toast, if desired, are allowed. The intravenous feeding is continued, except that glucose in water plus vitamins is substituted for part of the glucose in saline solution. On the third day, small amounts of a high-protein liquid mixture can usually be tolerated. On this day, 1 liter of the protein hydrolysate can be omitted from the intravenous feeding schedule. On the fourth day, the amounts of food are usually increased somewhat. At least 70 to 100 gm. protein are provided in the oral feeding; also oral vitamin capsules should be started. All intravenous feedings usually can be discontinued at this time. By the fifth day, the patient should be eating a full diet adequate in all nutrients. The recommended daily allowances of nutrients for normal, healthy people should probably be exceeded by about 100 per cent (except for calories) throughout convalescence, with the protein intake, especially, kept high.

FRACTURES AND OTHER MECHANICAL TRAUMA

Nutritional therapy should be directed towards the replacement of the losses and involves supplying proteins, calories, and all other nutrients in liberal amounts. The amount of protein to be administered depends on the extent of the fracture, the anticipated duration of convalescence, and the previous nutritional state. About 150 gm. protein per day may be needed in addition to 3000 nonprotein calories.

BURNS

For replacing losses and reconstruction of tissue, large amounts of protein are necessary (as much as 300 gm. per day), depending on the extent and severity of the burn. As much as 3500 to 5000 calories or more per day may be indicated. The patient may not be able to eat, but if he can drink, calories and protein can be supplied in adequate amounts in a special liquid mixture.

RADIATION INJURIES

Treatment of radiation illness appears to resolve itself into: (a) prevention of infection; (b) prevention of malnutrition and emaciation; and (c) attempts to correct the blood abnormalities. Calories and protein should be given in quantities as large as possible with vitamins and minerals administered liberally. Fluid and electrolyte balance must be maintained.

DIARRHEA AND DYSENTERY

Nutritional therapy should be effected by mouth as soon as possible. The diet of choice is a chemically bland, low-residue type, high in protein (1.5 to 2 gm. per kilogram per day), high in calories (45 calories per kilogram per day), and should be served frequently in small amounts. Vitamin supplements should be given with this diet. The high-protein and high caloric levels can be achieved by adding protein concentrates, such as dry skim milk powder, to suitable dietary items.

In chronic diarrheal diseases, including ulcerative colitis, bland, low-residue diets may have to be continued for long periods of time. To prevent tissue depletion and to accelerate recovery, it may be necessary to provide up to 4000 calories and about 150 gm. protein daily.

PEPTIC ULCER

The conventional diets used for the initial treatment of peptic ulcer are inadequate both in protein and calories. The first week's menus for a typical modified Sippy diet provide only 50 or 60 per cent of the protein requirements of a healthy individual, and the subsequent menus only 75 or 80 per cent of the recommended daily protein and caloric allowances. Patients with peptic ulcer should receive a minimum of 100 gm. protein a day. This can be accomplished and adequate protein be provided by adding milk powder to the milk and cream mixtures. Milk powder will have a buffer action and therefore may contribute to the acid-neutralizing action of the milk-cream mixtures. Protein hydrolysates have no advantage over intact proteins and have many limitations. The dietary regimen for ulcer in use today in the majority of institutions is a good example of how a therapeutic diet may lead to dietary invalidism. Physicians should be careful not to focus their attention so sharply on the disease that in planning diets they forget the normal and special nutritional requirements.

INFECTIONS

"Starving a fever" leads to a more severe illness, a prolonged convalescence, and precipitation of acute deficiency diseases. Febrile patients require 3000 to 4000 calories, 125 to 150 gm. protein, 3000 to 3500 cc. water, sufficient salt, and vitamin supplements. It is not sufficient to serve the required diet; the patient must consume it.

The caloric requirement will depend upon the presence of fever. In the absence of fever, 2500 to 3000 calories is a desirable level which will insure optimum utilization of dietary protein. About 150 gm. per day is desirable. Vitamin supplementation should be given to insure efficient metabolism of the ingested food.

DISEASES OF THE LIVER

Therapeutic diets in liver disease should provide a daily minimum of 3000 calories. These may consist of approximately 100 gm. protein, 400 gm. carbohydrate, and 100 gm. fat. A therapeutic vitamin capsule should be given daily. In addition, 25 to 50

An efficient source of nutrients

ICE CREAM has five characteristics which star it as a food of high nutritional value: nutrient contribution . . . acceptability . . . completeness of digestion . . . efficiency of nutrient utilization . . . and adaptability to many types of diets.

Ice cream supplies energy, protein, calcium, riboflavin, vitamin A, and all other nutrients occurring in milk.[1]

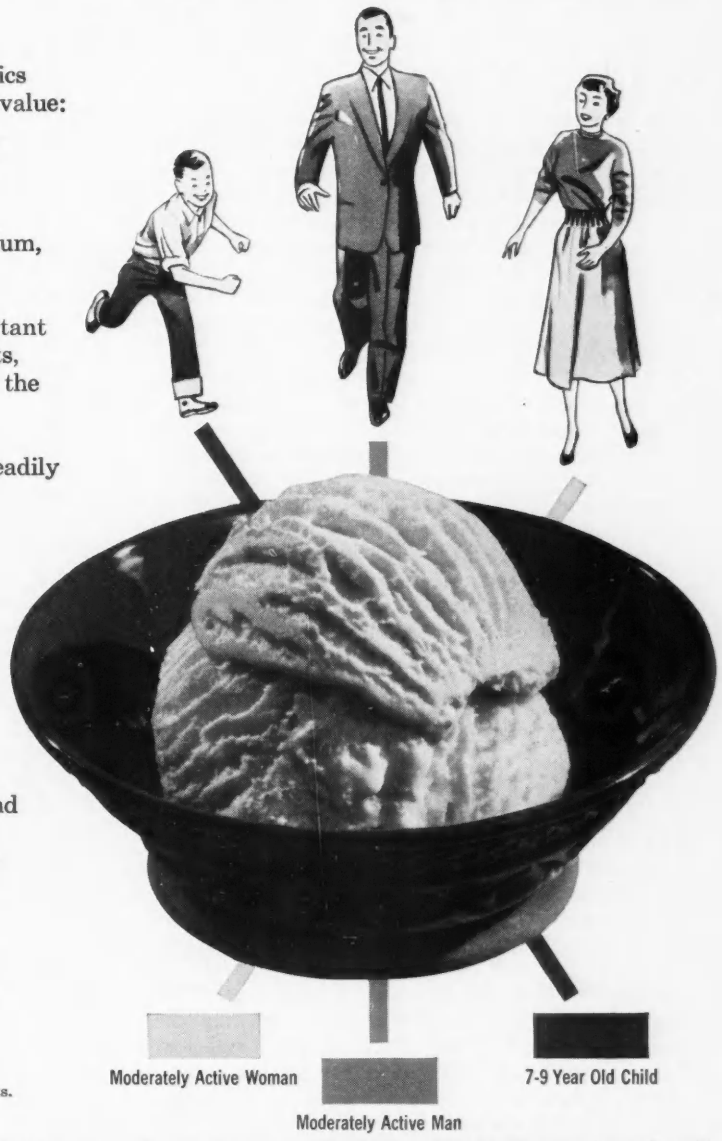
Ice cream is popular with all—an important nutritional fact. Regardless of its nutrients, a food has no value unless it is eaten, and the nutrients used by the body.

Laboratory studies show ice cream is completely digested . . . its nutrients are readily available to the body.[2,3]

The nutrients of ice cream are well utilized . . . milk protein, because of its desirable ratio of amino acids; the natural vitamin A, because it is preformed; the riboflavin, because it has been shown to be 100 per cent available to the body. No source of calcium is better utilized than that in milk.

Ice cream is valuable for everyday use by healthy people—and for therapeutic and convalescent diets, where energy value and body-building nutrients are needed in an easy-to-eat, readily digested form.

Ice cream is a good food, good for all.



[1]Dahlberg, A. C. and Loosli, J. K. Nutritive value of commercial ice cream. J. Am. Diet. Assn. *24*:20 (Jan.) 1948.

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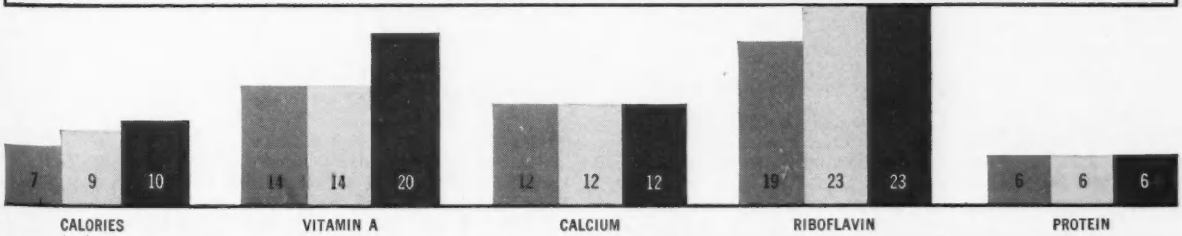
[3]Everson, G., Wheeler, E., Walker, H., and Caulfield, W. J. Availability of riboflavin of ice cream, peas, and almonds, judged by urinary excretion of the vitamin by women subjects. J. Nutr. *35*:209 (Feb.) 1948.

Percent contribution of one serving (1/6 qt.) vanilla ice cream to daily needs for some nutrients.



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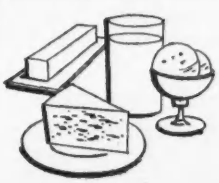

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Since 1915 . . . the National Dairy Council, a non-profit organization, has been devoted to nutrition research and education to extend the use of dairy products.

gm. brewer's yeast may be given daily. Vitamin K must also be given if the prothrombin time is found to be prolonged. This dietary schedule is applicable to both acute liver disease, such as infectious hepatitis, and chronic liver disease, such as cirrhosis of the liver. Patients with chronic liver disease and ascites present an additional dietary problem, for they excrete only small quantities of sodium in the urine. Therefore, patients with ascites and edema should receive low-sodium, high-calorie, high-vitamin diets, supplemented if necessary with occasional injections of a mercurial diuretic.

Obesity, underweight, diabetes, gout, renal calculi, osteoporosis and osteomalacia, hyperthyroidism, and Addison's disease are also given consideration.

Additional chapters cover: functions of components of the diet in metabolism, non-dietary factors affecting metabolism, the endocrine glands and metabolism, evaluation of nutritional status, consequences of nutritional deficiency, the relation of protein disequilibrium to disease, the treatment of starvation and severe undernutrition, and minimal allowances for rationing.

This compact report contains 94 pages of text and is documented by 785 references. It can be highly recommended not only for staff seminars and as a nucleus for a study program for dietetic interns, but also for serious study with medical committees. As the authors point out, "Medical school curricula are preoccupied with diagnosis and specific therapy. Little time or attention is directed towards the nutritional aspect of therapeutics. The medical graduate is expected to learn this aspect during his internship and residency. The hospital attending physician, whose responsibility is to teach the house staff, interested as he is in the intellectual challenge of diagnosis not infrequently neglects the adequacy of the patient's diet. The house officer, frequently identifying himself with his chief, also tends to relegate this aspect of the patient's care to the nurses and dietitians. He thereby neglects not only the patient, but also his own training. It is not sufficient to bring text books up to date. The medical schools must educate students in the application of the newer knowledge of nutrition."

In bringing this report to professional groups, it should be remembered that it is intended to be a stimulation to further search for truth rather than a dictum on therapeutic nutrition.

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LITERATURE ON DENTAL CARIES

NINA SIMMONDS, Sc.D.

University of California Medical Center, College of Dentistry and School of Medicine, San Francisco

Everyone interested not only in research on the etiology of dental caries and allied problems but also in the practice of dentistry will welcome this comprehensive review of the literature[1] on one of dentistry's most complexing problems. Dr. L. A. Maynard, Chairman of the Food and Nutrition Board, states: "The preparation of this report was initiated in November 1942, when a special committee was set up under the Food and Nutrition Board with instructions to undertake a critical review of the subject of dental caries, the objective being to provide the Board with a basis for an expression of judgment in the matter. Ten years of persistent labor on the part of Dr. P. C. Jeans and his committee, their numerous consultants, and the authors, superimposed on their full-time professional obligations, have gone into the production of this volume. The ultimate objective remains to be reached. The causes of dental caries are only partially understood at present, although much progress has been made. The Board has encouraged and supported this publication as a public service in the hope that it will help the adjustments of facts and principles into correct relationships and thus serve as a guide both in research and in education."

In the Foreword to this impressive volume, Dr. A. LeRoy Johnson, Division of Medical Sciences, National Research Council, comments: "The review of the literature on dental caries sponsored by the National Research Council is a distinct contribution to dentistry. It consists of abstracts of reports in this field with critical summaries by the committee appointed by the National Research Council. The summaries of each section emphasize details of special significance. Bringing together in historical perspective accounts of work that has been done provides, in tangible form, the sources and nature of investigations upon which present knowledge of dental caries rests. It reveals the situation as it is today."

There are seven sections in the volume and an excellent, selected, fifty-eight-page bibliography which contains not only the references but also the titles of the papers cited in the text. Dr. Guttorm Toverud, Professor of Pedodontia, Dental School of Norway, Oslo, devotes fifty pages to a comprehensive

[1] A Survey of the Literature of Dental Caries. By Guttorm Toverud, Gerald J. Cox, Sidney B. Finn, Charles F. Bodecker, and James H. Shaw. Prepared for the Food and Nutrition Board, National Research Council under the supervision of the Committee on Dental Health. Publication No. 225. Washington: National Academy of Sciences—National Research Council, 1952. Cloth. Pp. 567. Price $3.

(Advertisement)

INSIDE SCIENCE

The Vital Story of WHITE FLOUR ENRICHMENT

by Science Writer

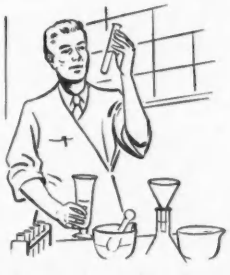
The blessings of better health and increased vigor are in store for many Canadians as a result of the start of flour enrichment by Canadian millers. Dramatic results in improving public health through the use of enrichment have been shown by experience in the United States, the Bataan peninsula in the Philippines, and Newfoundland. The benefits have been so outstanding in these and other nations that more and more countries are adopting enrichment.

1953 sees the enrichment of white flour put into practice throughout Canada. This program became possible through the recent amendment of the Food and Drugs Act.

Everyone in the milling industry knows that the great majority of Canadians, like other North Americans, want beautifully fine, white flour. When wheat is milled and processed to get this white flour which the public demands, vitamin and mineral values are unavoidably lost. The loss of essential vitamin and mineral elements is easily overcome by enrichment.

The enrichment of ordinary white flour is simple and inexpensive. It restores these vital vitamin and mineral factors to milled white flour: thiamine, riboflavin, niacin and iron. Calcium also may be added as an optional ingredient. Canadian specifications also provide for enrichment of higher extraction flour (Vitamin B White Flour, Canada Approved).

Technology is so advanced these days that scientists are able to "build" duplicates of many of Nature's essential complexes in the laboratory. This has happened with many vitamins. First, the chemical composition is learned and the pure substance is isolated. Then a "duplicate" is made which is identical with Nature's product chemically and in biological activity. A vitamin is a vitamin regardless of its source, just as salt is salt whether it comes from a mine or is evaporated from the sea. So efficient is large scale manufacturing that vitamins are sold at a lower cost than if they were extracted from natural sources.



These are the vitamin and mineral factors which are used in white flour enrichment:

Thiamine—also called vitamin B_1. This vitamin helps to build physical and mental health. It is essential for normal appetite, intestinal activity and sound nerves.

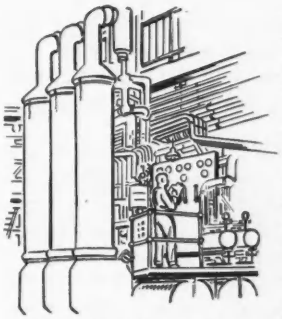
Riboflavin—also called vitamin B_2. This vitamin helps to keep body tissues healthy and to maintain proper function of the eyes. It is essential to growth.

Niacin—another "B" vitamin, is needed for healthy body tissues. Its use in diet is effective in controlling the serious disease, pellagra.

Iron—is the mineral used in enrichment. It is essential for making good red blood and preventing nutritional anemia.

To meet the amended regulations of the Canadian Food and Drugs Act, each pound of *enriched flour* must contain:

	Not less than	*Not more than*
Thiamine	2.0 milligrams	2.5 milligrams
Riboflavin	1.2 milligrams	1.5 milligrams
Niacin or Niacinamide	16.0 milligrams	20.0 milligrams
Iron	13.0 milligrams	16.5 milligrams



The Hoffmann-La Roche people manufacture top quality vitamins literally by the tons. To do this they must use amazingly complex processes with scientific production controls and the latest equipment which fill a building a city block square and many stories high. The flour-enriching ingredients are later combined in a form called premix which flour millers add to flour manufacture so that the enrichment is spread evenly throughout the flour.

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Introductory Review in which he gives an over-all picture of the dental caries problem from the research as well as from the practical points of view.

DIET AND TOOTH DECAY

The part of the volume which perhaps will have the greatest interest to dietitians, nutritionists, and others interested in nutrition is the ninety-page section by Dr. James Shaw, Assistant Professor, School of Dental Medicine, Harvard University, on "Nutrition and Dental Caries." Anyone who has had any connection with research on nutrition and dental caries cannot help being impressed with the tremendous amount of work which this survey represents. The following statements by Dr. Shaw are very important, since they serve as a background for understanding the complexity of the problems involved. He states: "It is conceivable to postulate that the food consumed by an individual throughout his entire life could directly or indirectly affect the susceptibility of the teeth to decay through the following channels: by alteration in the differentiation, development and maturation of the teeth and their supporting structures (the gingival margin, epithelial attachment, cementum, periodontal membrane and alveolar bone), by changes in the metabolic processes in the mature hard dental structures and in their supporting structures, by alterations in the composition and quantity of saliva, by differences in the functional ability of the teeth, their supporting structures and the salivary glands resulting from diets of varying physical characteristics, and finally, the most obvious and extensively investigated potential effect, but not necessarily the most important, by mixtures of food constituents with oral secretions to form the debris in the oral cavity and the materia alba on the tooth surfaces. Since the total effect of the diet may involve at least these and possibly additional, unrecognized modes of action, any accurate evaluation of the direct and latent role of the diet in the causation and prevention of dental caries must eventually consider each of these possibilities individually, and collectively in their proper relation to each other. Unfortunately the answers to many of these problems are not available for human beings or for experimental animals."

Dr. Shaw continues: "Early research in nutrition clearly related the nutritional value of the diet consumed during the developmental period to tooth structure. These findings prompted much speculation and research on the relation of nutrition, both during tooth development and after eruption, to tooth decay. Much of the research on the role of individual nutritional factors in the prevention of dental caries was performed in the period between 1920 and 1935."

The reviewer has been associated with the College of Dentistry, University of California Medical Center since July 1934 and has had the opportunity not only of discussing dental caries research problems with its staff members, but also has attended many dental meetings and has met and talked with many of the investigators in the field. Perhaps the following comments based on her chapter on "Nutrition and Diet in Dentistry" in the book entitled *Dentistry in Public Health*, edited by Pelton and Wisan (1), will assist the readers to understand better some of the divergent opinions expressed in Dr. Shaw's section: Although Boyd, Drain, and Nelson of the University of Iowa (2) were by no means the first to associate diet with the prevention of tooth decay, their observations on the control of caries by diet in diabetic children published in 1928 and 1929 tended to focus attention on the viewpoint of prevention by diet. For many years before the work of these investigators on children with diabetes, Bunting and his co-workers at the University of Michigan School of Dentistry had been interested in the dental health of children in certain orphanages. For several years the diet of the children in one of these orphanages was admittedly below the standards accepted as normal for children as regards protein, calcium, phosphorus, and vitamins; yet during this time, these children had a low incidence of tooth decay.

DIETS LOW IN STARCHES AND SUGARS

What is a possible explanation of this apparent paradox regarding diet and tooth decay? The facts are that two dissimilar diets have been published, each designed either to prevent or to arrest dental caries—one diet obviously adequate and the other admittedly inadequate.

It should be emphasized that neither Dr. Bunting nor his co-workers ever said that this inadequate diet produced optimal growth and well-being in these children. In fact, Koehne, Bunting, and Hadley (3) reported that 40 per cent of the 201 children between the ages of six and eighteen who had lived in the institution for an average of four years were stunted in height according to the Woodbury standards. Apparently confusion arose over the following points of view which were not clearly defined:

(a) Caries was arrested and in great measure prevented by a diet *which stunted the growth* of many of the children nourished on it.

(b) Caries was arrested and in great measure prevented by a diet *which would induce good growth and well-being* in children nourished on it. In other words, prevention of caries by diet was confused with the *promotion or retardation of growth and well-being by diet.*

A comparison of the diet of the children in the orphanage with that fed to the diabetic children by Boyd, Drain, and Nelson (2) shows that, whereas the two diets varied greatly in nutritive value, especially as to minerals and vitamins, they were much

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alike in one important detail, namely, that they were both low in sweet foods, such as jams, jellies, marmalades, cakes, cookies, candy, honey, sugar, and sirups.

This one detail—low intake of sweet foods in both regimens—undoubtedly accounts in part at least for the observed low incidence of tooth decay. An appreciation of this one point of similarity in these two dissimilar diets aids in an understanding of the probable role that sweet foods play in the development of dental caries. In some instances apparently, starchy foods, such as crackers, soft sticky bread, and biscuits which cling to the teeth, may also be etiologic factors in caries. In recording data, it would be better to use the terms "starches and sugars" or to name the suspected foods rather than to use the general term "carbohydrates."

OTHER FACTORS

What factors are known to be associated with the cause and prevention of dental caries? Nutrition is only one of several; among the others are heredity, mouth hygiene, chewing exercise, endocrine disturbances, developmental defects, systemic disorders, and lack of professional care. We have no control over heredity, but as Sir Gowland Hopkins has stated: "Nurture can assist Nature to a larger extent than has been supposed by the scientific thought of the past generation." Hence, an optimal diet should enable a child to build teeth as good as his dental inheritance potential permits, if factors known to interfere with dental development, such as endocrine imbalance or a systemic disorder which may interfere with digestion, assimilation, and utilization of nutrients do not intervene. In the population as a whole, these two disorders are probably not so important from the dental caries standpoint as are the factors over which the individual could have control if he would exercise it, such as professional care in eradication of developmental defects, personal care in practicing good mouth hygiene, and good nutrition.

The following comments by Dr. Shaw relative to tooth structure and dental caries incidence are apropos to the above statements: "The full significance of tooth structure in relation to the susceptibility to tooth decay cannot be evaluated on the basis of our present knowledge. In human material there appears to be a definite indication that, where the oral and systemic environment of the teeth are favorable to the processes of dental caries activity, those teeth which are poorly formed and calcified have a higher susceptibility to tooth decay than normal teeth. However, if the oral and systemic environments are not favorable for tooth decay, there is no evidence that a tooth will become carious merely because it is imperfect structurally."

Other phases of the problem of dental caries are covered with equal thoroughness in this review of the literature. Dr. Gerald J. Cox, Professor of Dental Research, School of Dentistry, University of Pittsburgh, has contributed three papers. He devotes fifty-eight pages to a review of the research and a discussion of experimental dental caries in animals; seventy-nine pages to the research on and importance of oral environment and dental caries; and eighty-seven pages to fluorine and dental caries. Dr. Sidney B. Finn, Professor of Dentistry, School of Dentistry, University of Alabama, presents fifty-four pages of discussion on the research of the prevalence of dental caries. Dr. Charles F. Bodecker, Emeritus Professor, Oral Histology and Embryology, School of Oral and Dental Surgery, Columbia University, presents sixty-four pages on the pathology of dental caries.

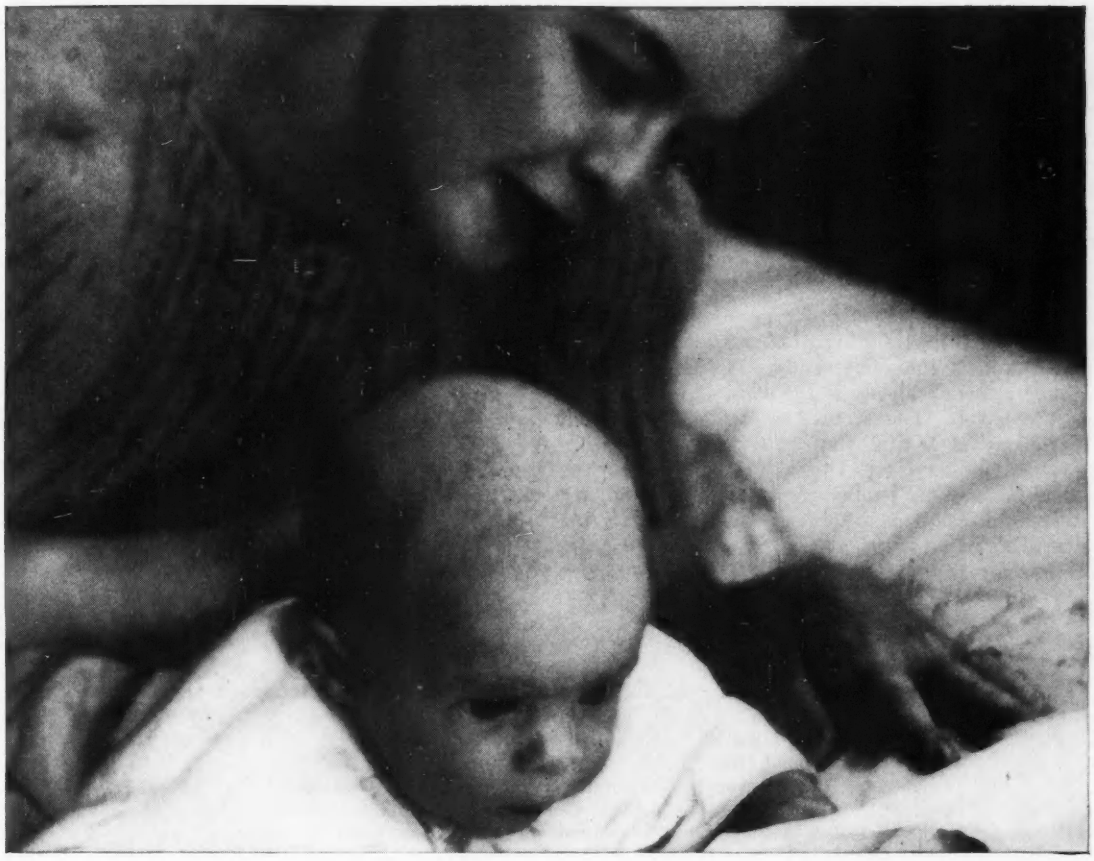
In his section on "Prevalence of Dental Caries," Dr. Finn comments: "A review of the dental literature impresses upon one the universal distribution of dental caries throughout the world. It is found in all nations without regard to geographic barriers or climatic variations. It is common to both sexes, to all races and at all economic levels and occurs in all age groups. Actually, dental caries presents a problem from pre-school age to old age. Without doubt, it is the most prevalent chronic disease affecting the human race today."

There is great professional and public interest in the role of fluorine in caries prevention. Several years must pass before the investigations in several parts of the country where fluoride treatment of water supplies are under way can be critically evaluated. As regards human experience, Dr. Cox comments as follows: "Fluorine affords a significant degree of protection against caries, the direct evidence being: (a) incidence of decay is reduced in districts in which fluorine-caused mottled enamel is endemic; (b) the incidence of caries is reduced in areas where fluorine is present in the community water supplies in amounts of the order of 1 p.p.m. The indirect evidence that fluorine protects against caries is: (a) fluorine is found in unmottled caries-free enamel; (b) fluorine in concentrations as low as 1 p.p.m. appreciably reduces the formation of acid from carbohydrates by bacteria." Like other research problems related to dental caries in man, it is difficult to make a controlled experiment, but human experience seems to indicate that 1 p.p.m. of fluorine in the water may be a public health measure which will aid in controlling the incidence of dental caries.

ACIDOGENIC VS. PROTEOLYTIC BACTERIA

The exact causes of dental caries are unknown. However, as Dr. Toverud comments, there is full agreement among investigators of this disease that bacteria are necessary for the production of dental caries. There is controversy between investigators as to whether acidogenic or proteolytic bacteria are the primary agents. The most widely accepted view is that acidogenic bacteria are chiefly or almost ex-

Anxieties about feeding totaled 33 per cent



A record of complaints made by 100 mothers of normal newborn infants illustrates in striking fashion the extent to which baby's "eating and digestion" constitute a source of maternal anxiety. Of 178 complaints cited by Carithers,[1] a total of 58 (or 33 per cent) were concerned with problems related to feeding. *1. Carithers, H. A.: J. Pediat.* 38:654 *(May) 1951*

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clusively responsible for the carious destruction of enamel. Recent studies of enamel caries, however, have provided evidence in favor of proteolytic bacteria. Since the enamel contains both organic and inorganic materials, Dr. Toverud considers it likely that both proteolytic and acidogenic bacteria are responsible for enamel caries.

Proponents of the proteolytic theory maintain that the tooth itself furnishes sufficient nutrients for bacterial activity and no extraneous substance is necessary for the initial destruction of the enamel. Proponents of the acid theory claim that the bacteria act chiefly through their enzymes on fermentable carbohydrates constituting a part of the dental plaque, with the resulting acid responsible for decalcification of the mineral parts of the tooth; the organic material, chiefly in the dentine, is destroyed by proteolysis. The section by Dr. Bodecker on "Pathology of Dental Caries" and the section on "Oral Environment and Dental Caries" by Dr. Cox should be carefully studied by persons who want to understand clearly the points of issue between investigators as to whether acidogenic or proteolytic bacteria are the primary agents.

Although it is true as Dr. Johnson comments in the Foreword, "As a whole the review reveals limitations resulting from the absence of standardized examination technic in determining caries incidence; the acceptance of deficient statistical data; restricted research interests; the lack of adequate controls in observations and experimental research; and the tendency to overlook the evolutionary status of the dentition in the human organism," nevertheless the Food and Nutrition Board of the National Research Council and the authors and their co-workers of these splendid reviews are to be congratulated upon the publication of this volume. They have assembled in one book the best thought of today relative to a very complex problem.

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Vanilla

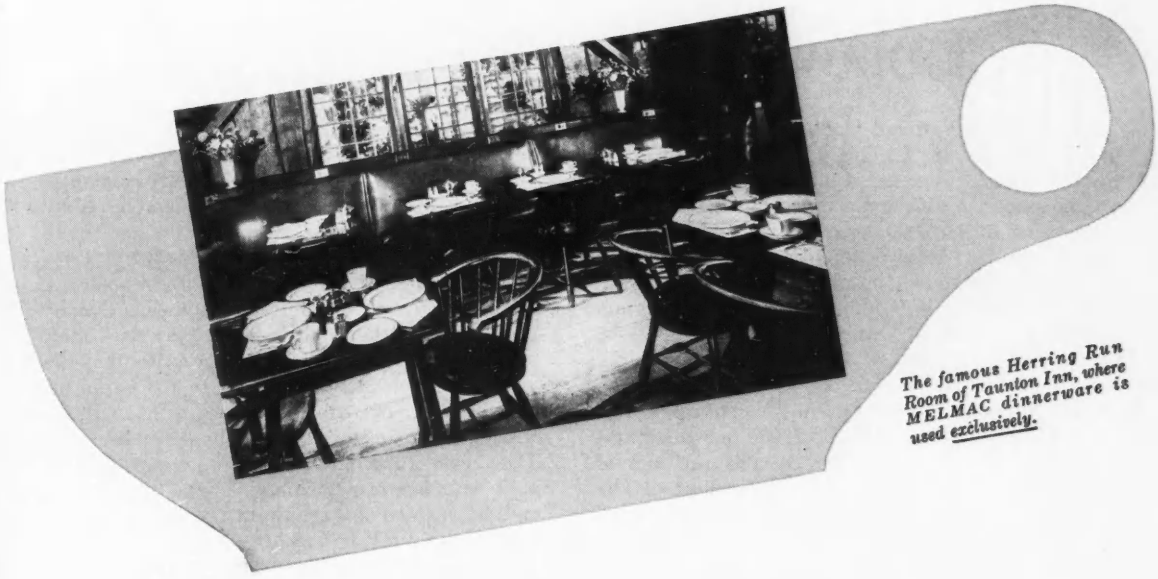
History does not tell how vanilla was discovered, but it is easy to imagine a visitor to Mexico wandering through the jungle and becoming aware of the lingeringly sweet aroma of the fruit of an orchid, now known as *Vanilla planifolis, Andrews*, which permeates the air as the fruit dehydrates.

Indians of the early days gave vanilla an historic, mystic background. The Totonacs worshipped Aroma as a goddess, deified as the vanilla orchid. Their legend is one of the most beautiful of that time. It tells of a lovely maiden named Tzacopnitziza, meaning "morning star," who was somewhat like a vestal virgin consecrated to the cult of Tonacavohua. She and her lover, Prince Zkatan-Oxaga (the young deer), were caught and decapitated. At the burial spot, the prince later appeared in the form of a tree, and the maiden reappeared as the vanilla orchid. Seeking the protection of the tree, the orchid embraced it and bloomed profusely. The buds became fruits of heavenly fragrance. Because of this legend, vanilla was declared a sacred plant and a divine offering.

Vanilla was also a delicacy of the Aztecs, who called it "tlilxochitl," meaning "black flower." Among all tribes it was a priceless treasure of the jungle, ranked among the rarest and most cherished tributes received by powerful priests and rulers, who delighted in its flavor. As currency it could buy anything. It was one of the most valuable products of commerce long before the discovery of America and was guarded with jealousy and pride until the conquerors finally obtained the secret.

Vanilla plants were taken to all parts of the world and, with the advent of manual pollination about a century ago, world production greatly increased and costs were lowered. This encouraged the development of better curing methods to overcome the uncertainties of nature.

Substitutes today are creating a wrong impression about vanilla; customers usually determine their preference by the lowest price and thus are disappointed in most vanilla flavorings. Not enough vanilla is used in these products for it to be recognized, and consumers therefore do not have the opportunity to know and enjoy its qualities. The public today needs a reintroduction to vanilla, for vanilla imports have increased little in the last thirty or forty years, despite the great increase in population in the United States and the still greater increase in production of foods sold as "vanilla-flavored." This alone is mute evidence of the extent to which other products have been substitutes for vanilla and sold as the genuine article.—*From: Maxwell, J. R.: Keep them saying, "Make mine vanilla." Coffee and Tea Industries and the Flavor Field 75: 61 (May), 1952.*



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What about Trichinosis?

At the First National Conference on Trichinosis in Chicago, Dr. S. E. Gould, Pathologist, Wayne County General Hospital, Eloise, Michigan, pointed up the public health importance of trichinosis. In autopsies of over 10,000 persons in the United States, the average incidence is found to be 16 per cent, although if methods of examination are more thorough, the incidence is about 30 per cent. Vernon Link, M.D., Medical Director, Communicable Disease Center, U.S. Public Health Service, Atlanta, estimated that one person out of six, or about 25 million, probably harbor trichinae. To reach this total, there would have to be 350,000 new infections each year. This estimate far exceeds the annual average of 336 cases reported in this country. The difference is due to inadequate reporting, mildness of symptoms, and the difficulties of making a clinical diagnosis. While only 40 per cent of the trichinosis in hogs can be blamed on those fed entirely on raw garbage, a majority of the remaining 60 per cent must be due to partial feeding of raw garbage.

Dr. Oscar Sussman, Chief, Bureau of Veterinary Public Health, New Jersey State Department of Health, pointed out that the states that raise a minimum of the total hogs marketed in the United States are creating many problems and jeopardizing the entire livestock industry by the continued practice of feeding raw garbage to swine. This practice spreads trichinosis and other hog diseases. The two main points to consider in controls affecting garbage-borne disease of hogs are: (a) is the state an exporter or importer of hogs and pork? and (b) is the state an exporter or importer of garbage?

Present interstate and state regulations to prevent garbage-borne disease of hogs is ineffectual. Regulations addressed solely to the interstate movement of raw garbage are not sufficient. Controls must consider *garbage*, *hogs*, and *pork*. The following regulations are recommended: (a) prevention of interstate movement of raw garbage except under certain specified conditions, and (b) prohibition of movement of live hogs and pork out of any state which fails to have and enforce regulations requiring the cooking of garbage fed to hogs.

The U.S. Public Health Service is instituting enforcement action of the section of the Interstate Quarantine Regulations which prohibits garbage to be shipped across state lines and fed to swine unless it is given minimum heat-treatment of 212°F. for 30 min.

Measures to prevent human infection include thorough cooking, curing, and below-freezing temperature treatment of pork as prescribed by federal regulations. According to Dr. Gould, other control measures used by some countries are microscopic inspection of muscle from every hog slaughtered, prevention of feeding of raw garbage to hogs, or cooking of raw garbage if it is to be fed to hogs.

Promising new methods include extension of techniques of rapid freezing treatment and exposure of all raw pork to ionizing radiation.

Donald L. Augustine, Ph.D., Professor of Tropical Public Health, Harvard University, reported that rapid freezing of pork may be one means of control. Data, although limited, indicate that pork may be rendered safe against trichinosis by (a) rapidly lowering the temperature to −35°C., or (b) by an initial rapid lowering of temperature to −18°C., with subsequent storage for three days at the same temperature. Thus, only a few hours would be required to make pork safe against trichinosis by a rapid freezing method, instead of up to twenty days now prescribed under federal regulations.

Ionizing radiation is another possible approach to the problem of killing trichinae in pork. Henry J. Gomber, Ph.D., and S. E. Gould, M.D., of the Atomic Energy Commission Laboratory, University of Michigan, Ann Arbor, reported that x-rays, gamma rays, and high energy electrons are effective in killing or interfering with normal development of living material. During the past year the effect of radiation on the life cycle of the causative agent of trichinosis has been studied.

One million roentgens of 200 KV x-rays are necessary to kill all trichinae larvae irradiated *in vitro*. The killing dose for Cobalt-60 gamma rays was found to be about the same. However, the life cycle of trichinae requires that the ingested larvae grow to maturity in the host and then reproduce, and much smaller than killing doses are sufficient to inhibit maturation. Even smaller doses will sterilize the female trichinae and prevent reproduction. With Cobalt-60 gamma rays, about 10,000 roentgens will sterilize the female larvae in rat muscle as determined by microscopic examination of the adult female forms recovered from the intestinal tract at six days and larval forms taken from the muscle of the test animals at thirty days. Somewhat lower levels of 200 KV x-rays are equally effective.

Because of the great penetrating power of Cobalt-60 radiation, it is believed that large sections of meat, such as hog carcasses could, under suitable conditions, be irradiated as a whole, thus providing a direct method of breaking the trichinae cycle.

The Conference was jointly sponsored by: American Board of Veterinary Public Health, American Medical Association, American Society of Clinical Pathologists, American Veterinary Medical Association, Association of State and Territorial Health Officers, Conference of Public Health Veterinarians, U. S. Public Health Service, and the Michigan-Memorial Phoenix Project, University of Michigan.

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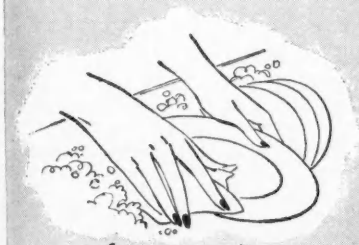

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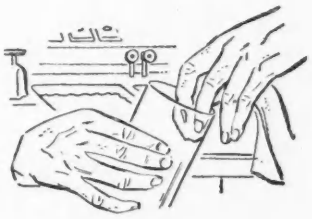

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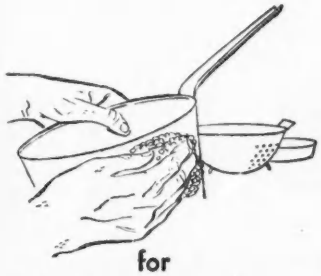

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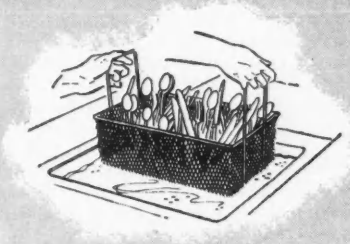

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Book Reviews

The Special Diet Cook Book. By Marvin Small. Introduction by James R. Wilson, M.D. New York: Greystone Press, 1952. Cloth. Pp. 511. Price $2.95.

This book, according to the author, combines in one volume 1200 tested recipes which are suitable for use in the dietary treatment of the major conditions usually treated, in part at least, by special diets. Included are low-calorie, low-sodium ("salt free"), diabetic, high-residue, low-fat and low-cholesterol, bland, and high-calorie recipes.

The section on diabetic diets is an extension of the Meal Planning and Exchange Lists which were developed by the committee of the American Diabetes Association, The American Dietetic Association, and the Diabetes Section, U. S. Public Health Service. A few additional recipes with corresponding exchange values are included. However, any diabetic person who understands the principles underlying the formulation of the exchange lists should be able to develop his own recipes without the use of a special cookbook.

Many of the recipes call for herbs and seasonings not usually found on the pantry shelf of the average homemaker. Unless all members of the family could be persuaded to consume the special foods, the homemaker would probably not be willing to spend time to prepare them in addition to regular food preparation.

The book contains, in addition to recipes, many useful charts and tables of food values presented in a form which would make them readily understood by the nonmedical reader. The book should serve as a useful reference for the physician and dietitian. In most instances, however, only one section of the book would be applicable to a particular patient, and the remainder would be relatively useless. It should also be recognized that the caloric and sodium values indicated must be taken as approximations because of the inherent variability in the composition of all food materials.

With the trend away from special diets and toward modifications of the regular or normal diet, this book would appear to have limited use. On the other hand, if a person on the special diet were particularly interested in food preparation, this book supplies many ideas for introducing variety and flavor into a diet.—*Dena C. Cederquist, Ph.D., Associate Professor of Foods and Nutrition, Michigan State College, East Lansing.*

Sodium Metabolism in Health and Disease. By Douglas A. K. Black, M.D., M.R.C.P. Springfield, Ill.: Charles C Thomas, 1952. Cloth. Pp. 79. Price $2.75.

The author of this monograph reviews literature on sodium metabolism published up to the year 1950, and includes many excellent references.

The first portion of the book deals with normal sodium metabolism. A discussion on the normal amounts of sodium and its distribution in body fluids is included, and renal regulation of body sodium is described. The author discusses in detail Homer Smith's hypothesis on the mechanism of sodium excretion. He also relates some works by other investigators which offer some criticism of this theory. A chapter is included on the internal circulation of sodium which deals with: the secretion and reabsorption of sodium in the alimentary tract, the principles of sodium exchange between plasma and interstitial fluid, and the relationship between interstitial and intracellular fluid. Amounts and concentrations of sodium in digestive secretions are listed. Some reference is made to sodium metabolism in infancy.

The second portion of the book deals with the abnormalities of sodium metabolism. Instead of discussing specific disease states and alterations in sodium metabolism, the author describes four syndromes of abnormal sodium metabolism: (a) sodium depletion with water depletion, (b) sodium depletion without water depletion, (c) sodium excess with water excess, and (d) sodium excess without water excess. Each syndrome is described in detail with references made to specific disease entities.

This book, in this reviewer's opinion, is an excellent presentation of sodium metabolism and should prove to be a valuable reference for those interested in this field.—*Ann Reimer, Senior Assistant Dietitian, The Clinical Center, National Institutes of Health, Bethesda, Maryland.*

The Gardener's Cookbook. By Jean Krofsky. New York: Thomas Y. Crowell Company, 1952. Cloth. Pp. 150. Price $2.50.

Sponsored by Eastern States Farmers' Exchange, this book on garden vegetables is an inspiration to the home gardener. So often a garden is made up of only the more common vegetables, and these, when harvested in overabundance, are likely to be prepared time after time by the same method—leading down the road to monotony.

To pique the interest of the prospective gardener, the author presents varied and unusual ways to cook and season the usual run of home-grown vegetables. To encourage interest in the less common vegetables, recipes are also given for such products as artichokes, kohlrabi, Chinese cabbage, and leeks. Chapters on appropriate sauces and dressings are included, as well as a small section on the more common herbs and their uses.

The cookbook is made complete by an up-to-date Pest Control Chart, information which is so vital to a successful garden, and suggested plantings for a model family garden.

This cookbook should prove to be a definite asset to home gardeners who wish to make the most of their efforts. —*Margene A. Wagstaff, Warrenville, Illinois.*

RECENT BOOKS RECEIVED

Health Instruction Yearbook 1952. Compiled by Oliver E. Byrd, Ed. D., M.D. Stanford, Calif.: Stanford University Press, 1952. Cloth. Pp. 232. Price $3.50.

It's Easy to Be a Good Cook. By Jessie deBoth. Garden City, N. Y.: Garden City Books, 1951. Cloth. Pp. 254. Price $2.50.

Kitchen Strategy. The Family Angle on Nutrition. By Leona M. Bayer, M.D., and Edith Green. Springfield, Ill.: Charles C Thomas, 1952. Paper, spiral bound. Pp. 94. Price $3.75.

Making the Most of Your Cooking Time. By Marie Armstrong Essipoff. New York: Rinehart & Company, Inc., 1952. Cloth. Pp. 297. Price $3.50.

Lüchow's German Cookbook. By Leonard Jan Mitchell. New York: Doubleday & Company, Inc., 1952. Cloth. Pp. 224. Price $3.

Dr. Howe and the Forsyth Infirmary. By Rollo Walter Brown. Cambridge, Mass.: Harvard University Press, 1952. Cloth. Pp. 188. Price $3.50.

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Foreign Flavor . . .

Kitchens in Thailand

In December, I attended the Constitution Fair, which lasts for a week or more and is an annual event in Bangkok. Personnel of the Food and Drug Division of the Ministry of Public Health of Thailand demonstrated twice daily the cooking of rice without excess water. Posters illustrated the improved method, and told visitors that beriberi may result from the common practice of eating highly milled rice and discarding the cooking water.

The main feature of the exhibit, however, was an arrangement of convenient kitchens at three levels of cost. The least expensive was a farm kitchen. The other two were such as might be built in city homes. Miss Rabiab Vachananda, of the Food and Drug Division, explained that they wished to emphasize convenient arrangement of items commonly used and consideration for safety and sanitation.

The model country kitchen had much in common with those in the village in which I work. A portable clay stove, in which either wood or charcoal can be burned, stood on a mud base within a wooden frame about a foot high. One improvement displayed was a metal shield placed behind the stove to protect the thatch from sparks. This shield had been made of flattened oil cans and painted black with stove paint. A galvanized iron hood was hung over the stove to carry away smoke. A woodbox stood beside the stove, and a small box on the nearby wall held coconut-shell spoons, metal turners, and such other cooking implements as are customarily used near the stove.

A screened "food safe," with legs set in kerosene containers to keep out ants, is frequently seen in village homes, but the slatted wooden dish rack, on which dishes and pans are placed bottom side up, is less common. Incidentally, the inside of a thatched house provides a natural rack for lids, large knives, and other implements which may be hung up by sticking them between two rows of thatch.

In the center of the country kitchen stood a low table made from a sturdy wooden box and a stool about 6 in. high. Since Thai country women customarily sit on the floor, or squat on their heels, while preparing food, this innovation was designed to provide a surface especially for food preparation, a little above the floor. Other features of this kitchen were covered rice and waste cans. Most of the innovations in the country kitchen could be made at home, of inexpensive materials. The cooking equipment was all of the type commonly used in farm homes in Thailand.

In the most expensive of the three kitchens, intended for a well-to-do Thai family, the charcoal stove had three burners, built into a tile base in which there was space for storing charcoal. Both the stove and the central work table were of a height for food preparation which is carried out in a standing, rather than a squatting position. The food safe, dish rack, and other conveniences were somewhat more elaborate than those in the country kitchen, and the big innovation was a sink with running cold water.

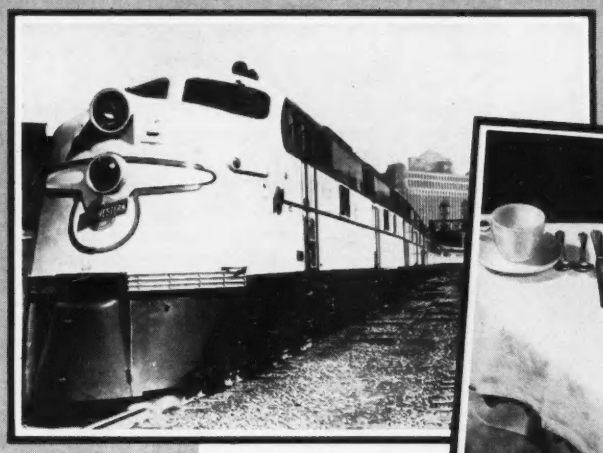
By way of comparison, a brief description of the kitchen attached to the newly-built house in which I live may be of interest. The kitchen is separate from the house, at the near end of the building which provides garage space and living quarters for two household helpers.

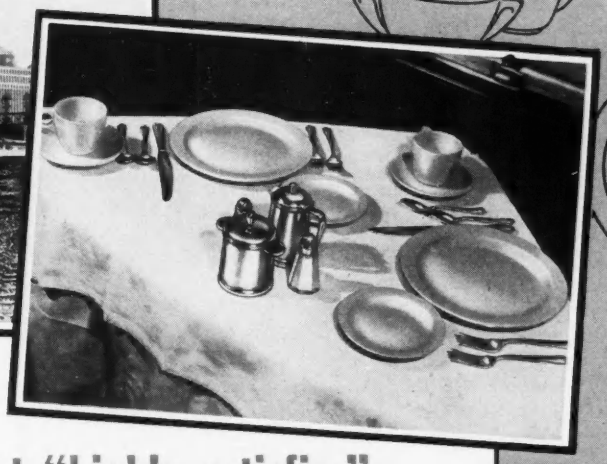
It has a three-burner charcoal stove, in a tile base. There is a window but no hood above the stove. Along one wall is a side shelf which holds the rice can and dishes. This shelf is large enough to be used as a work table, but in practice, food preparation is done on a table only 11 in. high. Nom, my versatile cook, made herself a 5-in. high stool of three boards salvaged from the construction work. She also nailed up a narrow board between two uprights to serve as a lid rack, and another, with nails on which our few items of small equipment are hung. The kettles for rice and soup and frying pans hang on nails beside the stove. The tea kettle is left on the stove, since it is in use whenever there is a fire in the kitchen. We boil all drinking water and heat water for dishwashing; hot running water is not a feature of Thai houses. A few steps outside the kitchen door is a cold water faucet. Here dishes and clothes are washed, the girls squatting on the floor or sitting on a low stool to work. A screened food safe stands in the kitchen, but the electric refrigerator is in the house proper, near the dining alcove. A refrigerator is often provided in a furnished house which a Thai landlord expects to rent to "farang." Because of it, we are able to keep foods fresh, and Nom does not have to go to market every morning.

A Thai Picnic

On December 15, the last day of the school term, we watched the village children in the primary school (grades one to four) prepare a picnic lunch on the school grounds. The teachers had divided the children into groups, but the children themselves had planned what to prepare and had brought food and equipment from home. Many a farm kitchen must have been nearly stripped of equipment, but that

a complete line without a break . . .





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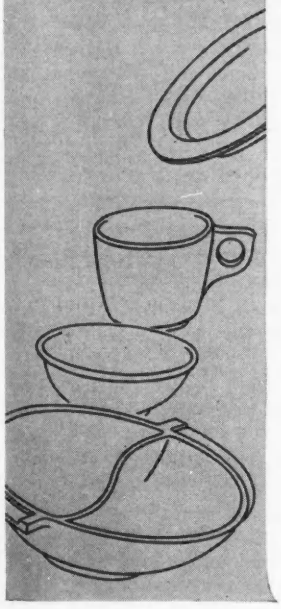

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would probably cause no serious inconvenience, since in most of the homes food is prepared only twice daily, morning and evening.

Most of the groups brought portable clay stoves from home, but a few made small fireplaces of old brick. Each group had at least one pail with which to carry water from the canal for food preparation and dishwashing.

The most interesting thing to me was the variety of dishes prepared and the ease with which each child went about his or her task. Each group cooked rice, some using clay pots and others aluminum pans. Each group also prepared one or more "with rice" dishes, and a sweet. (Sweets are not commonly served at home meals, but this was a special occasion.) Among the "with rice" dishes were fish, boiled or fried, with sauce; eggs, fried or made into omelet; vegetables, such as lettuce or cucumber, cooked with egg; and a variety of hot curries, including those made of fish, beef with potatoes and other vegetables, dried green peas, and Musselman curry, which contains peanuts and different spices from the usual Thai curries; also sour curries of lettuce, kraceed (a floating aquatic plant), and of katurai flowers.

The sweets included fruits, sweet potatoes, eggs, and young lotus stems, each cooked in palm sugar sirup; "chewy sugar" made by heating palm sugar until a thick sirup is formed, then allowing it to cool; balls of rice flour cooked in coconut milk; and glutinous rice topped with a custard made of coconut milk, palm sugar, and egg. One can see that successful Thai cookery requires some skill!

At home meals, Thai villagers customarily sit on the floor and help themselves from dishes which are placed in the center of the family group. For this special occasion, however, the school desks and chairs were brought into the school yard, two desks being put together to make a table for each group. We learned that the food was as good as it looked, for when all was ready, the head school teacher came to where my two Thai associates and I were sitting and said "The children invite you."—*Hazel M. Hauck, Ph.D., on leave from New York State College of Home Economics, Cornell University, Ithaca, as Nutrition Specialist, Cornell University Thailand Project 1952–53, and Recipient of Fulbright Research Grant for Thailand.*

An American in Paris

From France, Dolores Moore Carter writes of her experiences as a Fulbright Visiting Lecturer in Hospital Dietetics. She is working at L'Hôpital Bichat where she is pioneering in dietetics. When she arrived in September, not only was a dietitian an innovation in the hospital, even the word *diéticienne* was new. It has been her responsibility to establish the *Cuisine Diététique*, begin the use of therapeutic regimens for patients, and establish a course for student dietitians.

On her arrival, she found a newly equipped dietary kitchen which boasts a four-burner gas stove with an oven and broiler, a Frigidaire (both uncommon in France), modern built-in cupboards, a steamer, a "Turmix" (similar to an electric blender in the United States), and a balance scale especially calibrated with figures for protein and caloric content of the foods which are commonly used in the French dietary.

Initially, therapeutic diets were prescribed for four patients, three with advanced cirrhosis of the liver and a fourth who has a diagnosis of malnutrition complicated with diarrhea, a gastrectomy, edema, and anemia. At present, twelve patients of the twelve hundred receive therapeutic diets. The latest additions to the special diets have been for patients with nephritis, obesity, and diabetes.

The fourteen student dietitians in Mrs. Carter's class are now in their second year of a two-year course of the L'Ecole de Diététique which was established in October 1951. During the first year, their theoretical work included biochemistry, physiology, food technology, nutrition, and cookery. In the second year, they will spend four months of *travaux pratique* (practical work) at L'Hôpital Bichat in the Cuisine Diététique where they will deal with patients with medical disorders, and four months in the Cuisine Diététique at the Villejuif (Institute of Cancer) where they will work with patients who have undergone surgery.

Simultaneously with this practical experience they are given lectures on the medical and surgical aspects of disease and diet. In working with these students, Mrs. Carter reports that the workshop technique of group dynamics has proved to be advantageous, resulting in spontaneous action and interaction. The group has developed, translated, and adapted many interesting nutritional materials for France. Recently the students have worked on recipes for patients on high-protein, low-sodium diets, using *lait caille*. A library room with reference books, charts, and posters on nutrition in health and disease has been established, and the students are informed of the resources available in Paris.

Mrs. Carter, who is living at the U. S. House at the University of Paris, in November supervised the preparation of a typical American Thanksgiving dinner for 170 students and guests, many of whom did not know what cranberry sauce is and had never heard of "dressing" or "stuffing." American foods were obtained through the American Embassy Commissary. The cooking itself was done in a "broken down" kitchen which had not been used for fifteen months. One of the pans (made of tar and cardboard and a relic of the German occupation) literally collapsed while on the stove with brown Betty in it. The dessert was quickly transferred to another pan which was more "stable to heat" and proved most popular with the students.

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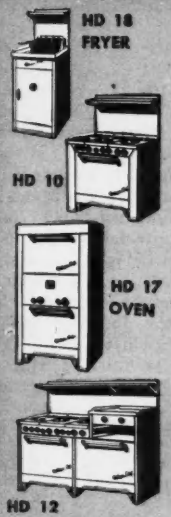

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Current Literature

Contributed by Mildred Bonnell and administrative dietetic interns, University of Washington, Seattle; Janette C. Carlsen and Ethel M. Miller, The Johns Hopkins Hospital, Baltimore; Berdena Rosenow, University of Kansas Medical Center, Kansas City, Kansas; Elizabeth H. Tuft, Wesley Memorial Hospital, Chicago; and the Journal staff

AMERICAN JOURNAL OF MEDICINE

Vol. 13, December, 1952

* Current principles of management in gout. A. B. Gutman and T. F. Yü.—p. 744.

Management of Gout. It is impossible to limit purine formation completely by manipulation of diet alone. Uric acid and other purines are elaborated for the most part by biosynthesis from simple nitrogen and carbon precursors derived from dietary proteins, fats, and carbohydrates as well as by degradation of preformed purines. The diet can, however, be important in regulating the magnitude of purine formation and excretion and is, therefore, a significant consideration in gout. Ingestion of purine-rich foods markedly increases the purine load. Meats, fish, and fowl, if taken in sufficient quantity, also cause an appreciable rise in urate production. Diets high in fat and low in carbohydrate and protein also influence purine metabolism, but chiefly at the renal level, causing a sharp decline in urinary urate excretion with a concomitant rise in serum rate. High-carbohydrate diets cause little or no measurable increase in urinary urate excretion.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 42, December, 1952

* The investigation of food-borne outbreaks of acute gastroenteritis. M. Feig.—p. 1535.
* Dietary studies of school-age children in Ascension Parish, Louisiana. F. E. Whitehead.—p. 1547.
* Toxicological evidence of the safety of the fluoridation of public water supplies. F. F. Heyroth.—p. 1568.

Gastroenteritis Investigation. Finding the ultimate source of food contamination resolves itself into locating the human carrier or the infected animal or other source. Defects in food sanitation are always secondarily responsible and can in most instances be readily determined. Briefly, the great majority of food-borne gastroenteric outbreaks are due to Salmonella and Shigella organisms. Asymptomatic carriers of these infections are not uncommon, so that routine fecal cultures should be obtained from all food handlers. In addition, the possible purchase of Salmonella-diseased or infected animals and fowl prior to slaughter, or their products, is not to be ignored. In Shigella outbreaks, the possibility of the fly as an insect vector must be kept in mind. Methods and difficulties in the investigation of food-borne acute gastroenteritis from a public health standpoint are suggested.

Dietary Studies of Children. A dietary survey of school children in Ascension Parish, Louisiana, showed that 38.9 per cent had poor food habits, 59.5 per cent fair, and 1.6 per cent good. Poor food habits were held to be problems which could be approached through nutrition education; therefore, a supervisor of school lunch was appointed and nutrition education activities were instituted under the leadership of teacher committees. An appraisal made the following year showed a significant reduction in poor food habits throughout all grades. High school students had poorer practices than children in elementary grades, but plotting the progress of one group as it advanced to higher grades showed that those within the program improved from grade to grade in food habits. To determine the role played by economic factors, a comparison was made with nearby St. Martin Parish where no nutritional education program had been conducted but where potential food expenditures were higher. Since the over-all diet in St. Martin was hardly half as good as that in Ascension, it appears reasonable that the improved food habits in Ascension resulted from the educational program.

Fluoridation. Animal experimentation shows that the prolonged intake of quantities of fluoride too small to induce dental fluorosis does not result in nondental manifestations of chronic intoxication by fluorides. Epidemiologic data and clinical and radiographic examinations of exposed industrial workers indicate that only when the fluoride content of a water supply exceeds 5 or 6 p.p.m. will its prolonged usage result in detectable osseous changes and then only in the most susceptible persons. The evidence as a whole is consistent in offering assurance that bringing the fluoride concentration in communal water supplies to that known to be optimal for dental health is a prophylactic public health procedure which has an ample margin of safety.

ANNALS OF INTERNAL MEDICINE

Vol. 37, November, 1952

* Dietary modification of the metabolic and clinical effects of ACTH and cortisone. L. W. Kinsell, J. W. Partridge, L. Boling, and S. Margen.—p. 921.

Dietary Control of Effects of ACTH and Cortisone. Untoward clinical and metabolic effects in patients receiving ACTH and cortisone may seriously impair their therapeutic application. These effects may be prevented or controlled by the following dietary modifications: (a) restriction of sodium to 1 gm. or less per day to prevent edema; (b) inclusion of 120 to 200 gm. protein daily to offset the accelerated protein catabolism; (c) inclusion of sufficient calories to prevent excessive catabolism of protein for energy; (d) limitation of carbohydrate to prevent diabetogenic symptoms; and (e) use of high potassium for control of muscular weakness.

CANADIAN MEDICAL ASSOCIATION JOURNAL

Vol. 67, December, 1952

* Optic nerve degeneration in pernicious anæmia. H. H. Hyland and V. J. H. Sharpe.—p. 660.

Pernicious Anemia and Optic Nerve Degeneration. It is well known that visual impairment may occur in pernicious anemia due to retinal hemorrhages or thrombosis of retinal vessels. Neurologic lesions may involve the optic nerve, causing progressive visual impairment and ultimately optic atrophy. Adequate liver therapy will be effective only where no marked degree of optic atrophy exists. It is, therefore, advisable that every middle-aged patient with progressive loss of vision be investigated for pernicious anemia.

THE INDIAN JOURNAL OF MEDICAL RESEARCH

Vol. 40, January, 1952

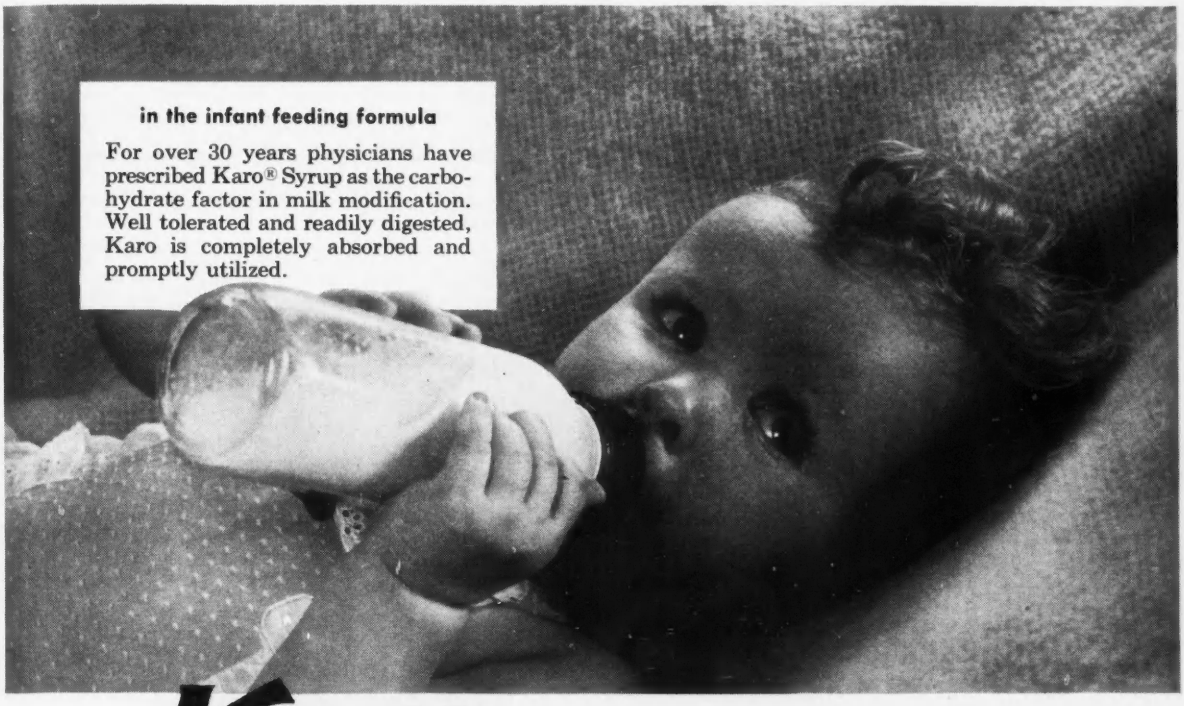
* Amino-acid composition of Indian foodstuffs. Part I. Tryptophane, leucine, isoleucine and valine content of some cereals. S. C. Balasubramanian, M. Ramachandran, T. Viswanatha, and S. S. De.—p. 73.
* Studies in protein metabolism: creatinine excretion in urine in relation to sources of dietary proteins. P. V. Karambelkar, V. N. Patwardhan, and A. Sreenivasan.—p. 89.

Vol. 40, April, 1952

* Changes in dietary habits and physique of Hos. S. B. Lal.—p. 193.
* Investigations into the dietary habits of the aboriginal tribes of the Abor Hills (North-eastern frontier). Part I. Padam areas. P. N. Sen Gupta.—p. 203.
* Amino-acid composition of Indian foodstuffs. Part II. Lysine, methionine, phenylalanine, and histidine content of some cereals. S. C. Balasubramanian, M. Ramachandran, T. Viswanatha, and S. S. De.—p. 219.
* The effect of various fatty acid fractions of coconut oil on calcium metabolism in normal growing rats. M. Narayana Rao and S. S. De.—p. 235.

A cylinder-plate method of microbiological assay of nicotinic acid. J. N. Karkun and S. P. De.—p. 257.

* A method for the estimation of tocopherols in blood plasma. P. N. Joshi and R. G. Desai.—p. 277.



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Amino Acids in Indian Cereals. Four essential amino acids—tryptophan, leucine, isoleucine, and valine—in several varieties of five cereals—rice, cholam, cumbu, ragi, and wheat—have been estimated microbiologically using *Lactobacillus arabinosus* 17.5. Details of the method are given, and a critical appraisal is made of the results.

Creatinine Excretion. Observations of 24-hr. urinary creatinine excretion are reported with seven human subjects on two diets with different proportions of animal proteins, the total protein intake in the two periods remaining the same for each subject. Substitution of animal proteins for vegetable proteins caused 8 to 21 per cent increase in creatinine in at least four subjects.

Dietary Habits in India. Surveys of the income, dietary habits, and nutritional status of the aboriginal tribe of Hos in 1941, 1949, and 1950, revealed that, with an increase in income of as much as 600 per cent from 1941 to 1949, consumption of foodstuffs had risen in all economic groups. However, consumption of various foodstuffs in 1950 was less than that in 1949, and more children had nutritional defects believed to be due to deficiency of one or more nutrients.

Dietary Habits of Aboriginal Tribes. A dietary survey of families of the aboriginal tribes of the Abor hills (Assam) was carried out in the winter of 1948–49. The economic status, living conditions, dietaries, education, and food supply of three hundred thirty-six families in seven villages were investigated. Of self-sufficient families, 63 per cent, and of the poorer families, 40 per cent received adequate calories. Protein intake was satisfactory and so also the calcium intake. Vitamin A and ascorbic acid intake were below the standards laid down by the Nutrition Advisory Committee; riboflavin intake was negligible, but the intakes of thiamine and niacin were satisfactory. Paddy was the main crop in the lower region, but *Annyat* was raised and eaten in larger quantities on the high hills. *Apong*, the Abor beverage, prepared from millet ragi by mild fermentation, contained many nutrients and less than 5 per cent alcohol. It was drunk by the people instead of water. Milk, oils, fats, sugar, and jaggery were not used, and the intake of flesh foods depended on the time the male members could spare for hunting and fishing.

Amino Acids in Indian Cereals. Four essential amino acids—lysine, methionine, phenylalanine, and histidine—have been estimated microbiologically in several varieties of five common Indian cereals—rice, cholam, ragi, cumbu, and wheat. Details of the method are given and critical appraisal is made of the results. Attention has been drawn to the decrease in lysine content of cereal flours during storage, and the implications of this on the general nutritive value of cereals are discussed. Evidence is presented for adoption of the amino acid analysis on the whole foodstuff in preference to separation of proteins and subsequent analysis.

Fatty Acids and Calcium Metabolism. The inclusion of 10 per cent fat (coconut oil, saturated and unsaturated fatty acid fraction) in a normal diet increased the utilization of calcium in young growing rats. The urinary excretion of calcium was affected only indirectly by the presence of fat in the diet. When fecal calcium was considerably increased, there was a decrease in the urinary calcium.

Tocopherols in Blood Plasma. A new method is described for determining the total tocopherols in plasma.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 150, December 6, 1952

* Transmission of radioiodine (I^{131}) to infants through human maternal milk. C. E. Nurnberger and A. Lipscomb.—p. 1398.
* Food production by fungi. Editorials and Comments.—p. 1408.
* Regional enteritis. Queries and Minor Notes.—p. 1445.

Vol. 150, December 13, 1952

* Milk and headaches. Queries and Minor Notes.—p. 1549.

Vol. 151, January 17, 1953

* Management of breast feeding. G. R. Barnes, Jr., A. N. Lethin, Jr., E. B. Jackson, and N. Shea.—p. 192.

Radioiodine. Recent observations have demonstrated significant thyroid gland concentration of radioactive iodine in two infants, breast-fed by mothers who were being given diagnostic tracer doses of the substance. A preliminary report of the findings is given, indicating that diagnostic tracer studies on lactating mothers may be harmful to the child and also unreliable as a diagnostic tool, since the iodine may be diverted from the thyroid to the milk.

Fungi. Scientists appear to agree that food requirements of the second half of the twentieth century can be met by conventional methods. Many maintain, however, that it is essential to raise the caloric intake of undernourished peoples and to provide them with adequate mineral, vitamin, and protein elements. Several fermentation processes, which utilize fungi as the converting organism, have been evolved to transform nutritionally valueless substances into high-protein foods. The proteins in fungi are surprisingly similar to those in meat, while their efficiency in producing protein from carbohydrates is about 65 per cent as compared to approximately 20 per cent for pork, 15 per cent for milk, 5 per cent for poultry, and 4 per cent for beef.

Regional Enteritis. Chemotherapy should not be continued indefinitely in cases of regional enteritis, although it has its place in the treatment of the disease, as does hormonal therapy. Nutritional rehabilitation of the patient is essential even if special devices, such as tube feeding or parenteral feeding, are necessary.

Milk and Headaches. Consumption of 3 qt. milk daily by a fifteen-year-old boy did not cause his headaches as had been suggested. However, such an ingestion of milk may be considered to be indirectly harmful since it would probably curtail the intake of other needed foods rich in protein.

Breast Feeding. The procedures utilized in establishing breast feeding, and the management of some of the problems that arise are described from the prepartum period through weaning. The success or failure of breast feeding is largely determined by the interrelationships of mother, father, baby, and environment. Environment includes the type of hospital routine and the generally prevailing lay and professional attitudes toward breast feeding. Each case may be managed differently. In general, the aim in the management of breast feeding has been to keep the process as natural and simple as possible. Two recent trends in hospital maternity care are intended to help in this direction: the self-demand or flexible-schedule method of feeding and the rooming-in type of care of mother and baby.

JOURNAL OF BIOLOGICAL CHEMISTRY

Vol. 199, December, 1952

* Properties and distribution of vitamin B_{12}. U. J. Lewis, D. V. Tappan, and C. A. Elvehjem.—p. 517.
* Studies on copper metabolism. IV. The influence of copper on the absorption of iron. M. S. Chase, C. J. Gubler, G. E. Cartwright, and M. M. Wintrobe.—p. 757.

Properties of Vitamin B_{12}. Vitamin B_{12f} isolated from rat feces has been shown to be a cyanide complex. It is completely inactive in promoting growth in the rat and chick, but does possess growth-stimulating properties with *Lactobacillus leichmannii*, *Escherichia coli*, and *Euglena gracilis*. In the rat, orally administered vitamin B_{12f} is excreted primarily by way of feces. With injection, elimination is principally through the kidneys. These data suggest that vitamin B_{12f} (f = feces) is identical with pseudovitamin B_{12}.

Influence of Copper on Iron Absorption. Five groups of rats were fed a basic milk diet supplemented with iron. One group received no copper supplement, while the other groups received copper supplements in graduated amounts to determine the influence of dietary copper on the iron absorption. Evidence indicated that there is less iron absorption from the gastrointestinal tract of copper-deficient rats than in rats supplied with copper, although above certain levels of copper ingestion, the iron absorption is not increased but may be somewhat reduced. Experiments to determine whether copper influences the absorption of the iron with which it is administered and whether copper in tissues influences iron absorption appeared to show that the effect of copper on iron absorption is correlated with the level of copper in the tissues and not with the simultaneous administration of both minerals.

THE JOURNAL OF THE CANADIAN DIETETIC ASSOCIATION

Vol. 14, December, 1952

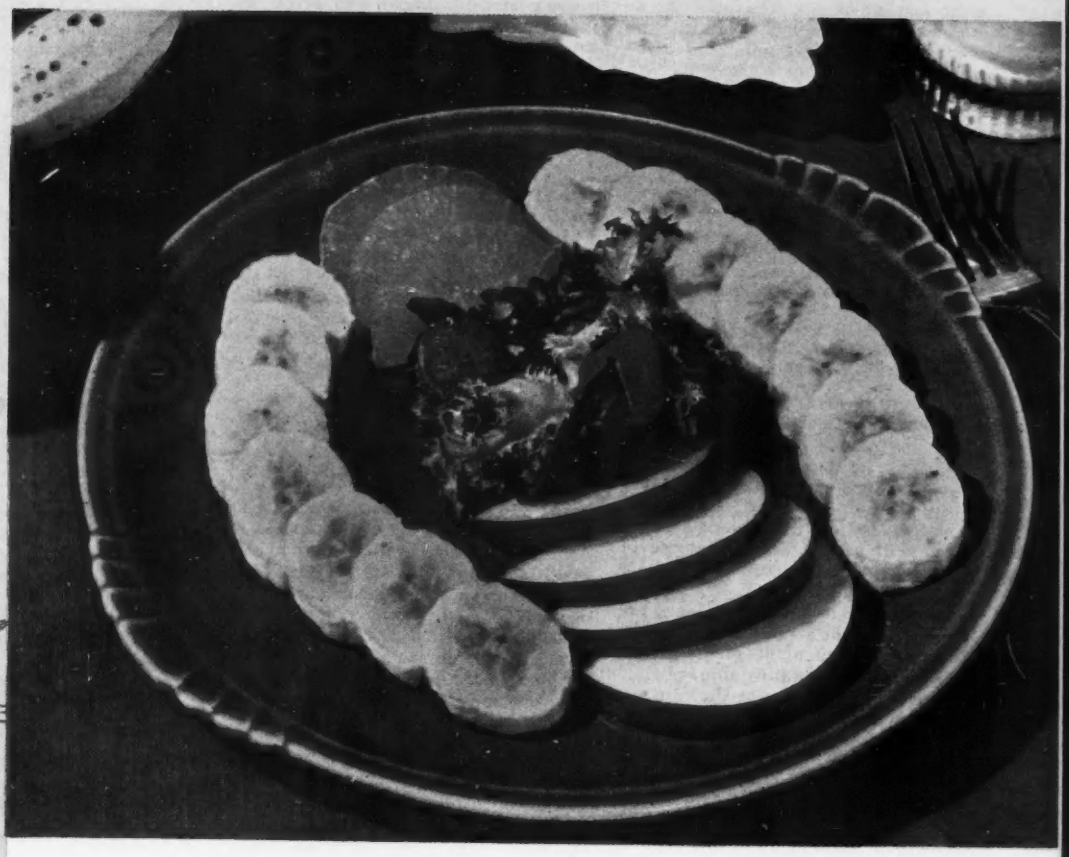
* Better bannock. M. Lock and L. B. Pett.—p. 9.

Better Bannock. Bannock, a homemade bread rather like a thick pancake,

CHIQUITA BANANA SAYS:

Serve as a salad or dessert...

Banana Fruit Plate



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1 orange, peeled
1 sweet red apple, unpeeled
2 or 3 berries or cherries
1 ripe banana*
Crisp salad greens

Use fully ripe banana...yellow peel flecked with brown

Cut orange crosswise into slices, then each slice into halves. Wash apple and cut into wedges. Peel and slice banana. Arrange apple wedges, orange and banana slices as shown in photograph. Garnish. Serve with sweet or tart dressing.

Makes 1 large or 2 small servings.

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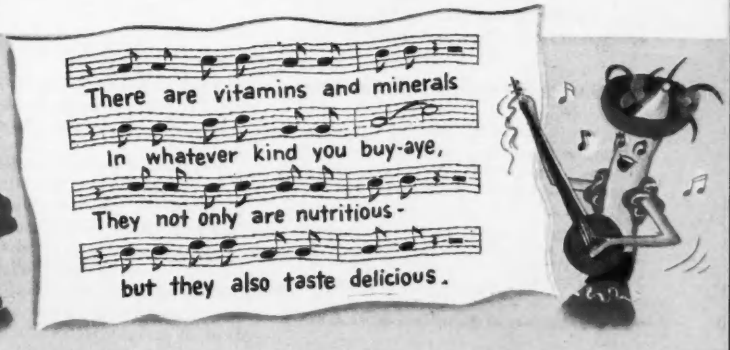

is a staple food for thousands of Canadians, especially in the North. The chief ingredients are flour, water, salt, whatever lard or oil is available, and baking powder when possible. When bannock is the sole article of diet, nutritional deficiencies develop. The answer to this problem has been found in the preparation of a mix containing dry milk powder, which supplies valuable protein, minerals, and vitamins, especially calcium and riboflavin. The mix can be stored at average room temperature, and the product has been favorably received from a standpoint of palatability. Although the cost is greater than that of the ordinary ingredients of bannock, because of the added nutrients and the thermoseal package, the cost-differential is inconsequential for such health values.

JOURNAL OF HOME ECONOMICS

Vol. 44, December, 1952

* The effect of heat on the biological value of proteins. A. F. Morgan.—p. 761.
* Factors influencing consistency of a lemon-pie filling. H. J. Nielsen, J. D. Hewitt, and N. K. Fitch.—p. 782.

Effect of Heating Proteins. Heating is known to cause damage to the growth value of proteins other than those of beans, lysine appearing to be the chief amino acid affected. The conditions governing the severity of damage seem to be temperature, duration of heating, presence of carbohydrate, presence of moisture, and nature of the protein. Specific changes caused by heating cereals, milk, meat, fish, and eggs are discussed, but the seriousness of the loss of protein value in terms of the human diet has not yet been fully appraised.

Consistency of Lemon-Pie Filling. Using standardized materials, as nearly as possible, and standardized procedures, a study was made to note the effect on the consistency of lemon pie filling of such factors as (a) cooking period of starch paste-egg yolk mixture, (b) period of cooling the mixture before adding the lemon juice, and (c) the acidity of the lemon juice. Experimentation with cooking time at two levels, acidity at three levels, and waiting time at three levels yielded eighteen possible ways of preparing the pie filling. The cooking time, which in actual practice is easy to control, was a significant factor affecting the consistency. A small but significant reduction in firmness of the filling was observed when the waiting time before adding the lemon juice was increased. The acidity of the lemon juices apparently had little effect on the consistency.

THE JOURNAL OF NUTRITION

Vol. 48, November, 1952

* Thiamine metabolism of women on controlled diets. I. Daily urinary thiamine excretion and its relation to creatinine excretion. H. A. Louhi, H-H. Yü, B. E. Hawthorne, and C. A. Storvick.—p. 297.
* Thiamine metabolism of women on controlled diets. II. Daily blood thiamine values. R. B. Dubé, E. C. Johnson, H-H. Yü, and C. A. Storvick.—p. 307.
* Basal metabolism of the Eskimo. K. Rodahl.—p. 359.

Thiamine Excretion. A diet affording approximately 2000 calories daily was the basis for studies to determine urinary excretion of thiamine and creatinine and the concentration of thiamine in the blood. It is known that thiamine nutrition can be fairly accurately determined by measuring the amount of urinary thiamine excretion, but the theory was advanced that the amount of thiamine found in a single voiding of urine might also reveal an individual's thiamine nutrition, thereby saving time in analysis. Three methods of evaluating thiamine status were used with the result that a daily thiamine intake of 500 mcg. per 1000 calories was found to be sufficient for six of the subjects and borderline for two. Indications are that this method of determination can be used for a rough estimate of thiamine nutrition.

Blood Thiamine Values. In checking daily values for micrograms of thiamine per 100 ml. whole blood in the previous experiments, it was found that an intake of about 500 mcg. thiamine per 1000 calories yielded an average fasting blood thiamine ranging from 3.3 to 5.4 mcg. per 100 ml. of whole blood or 7.0 to 11.2 mcg. per 100 ml. packed cells. Lowering the thiamine intake lowered the fasting blood thiamine also.

Eskimo Metabolism. A total of 340 basal metabolism tests were made on 73 healthy Eskimos (52 males and 21 females) from four different locations in Alaska, representing different climatic conditions, living habits, and diets. One group lived on a diet consisting largely of sea and land mammals and fish. A second group, from 3000 ft. above sea level, ate land mammals, especially caribou meat, almost exclusively, while a third group subsisted mainly on white man's food. The fourth group, inhabitants of an island, lived predominantly on sea mammals, especially walrus. All groups were examined both in winter and summer. In addition, representatives of each group were studied while living on the white man's diet at Ladd Field. The basal metabolism of Eskimos examined for the first time in their native habitat was significantly higher than that of whites. Approximately 15 per cent of the higher rate may be accounted for by the high-protein intake of the Eskimo. When this factor, along with apprehension, was eliminated, there was little difference between the metabolic rates of Eskimos and the white controls, indicating that there are no racial differences in basal heat production.

THE LANCET

No. 6744, November 29, 1952

* Effect of weight-reduction on normal and raised blood-pressures in obesity. L. Martin.—p. 1051.

Weight Reduction and Blood Pressure. In this study, the effect of weight reduction on blood pressure in obesity with hypertension was both inconstant and unpredictable. The chance of occasional success, coupled with subjective improvement in the great majority of cases, appears to justify the continuation of weight reduction as a routine measure in obese hypertensive patients. Moreover, the loss of substantial weight of fat must reduce the demands made on the heart during ordinary daily life, quite apart from strenuous exertion.

MODERN MEDICINE

Vol. 20, November 15, 1952

* Obesity and diet control. J. H. Barach.—p. 74.

Obesity Control. The total daily food requirements recommended by the National Research Council are being questioned. In working with diabetic persons, it has been found that normally active men and women subsist year after year on diets of 1800 to 2000 calories per day instead of the 2400 calories believed to be the minimal requirement for good health. The effects of prolonged forced feeding on animals are being studied, leading to the assumption that if carbohydrate in food that is nibbled throughout the day is utilized immediately, there will be no need to convert carbohydrate into fat. The question of endocrine control of fat metabolism is important insofar as obesity is concerned, and the clinician has long recognized the problem of infertility in the obese. If the latter problem were clarified, obesity and endocrine deficiency might yield to properly directed therapy. Treatment of obesity can be simple, but treatment of the obese patient may turn out to be extremely complicated. It is still hard to convince the patient that the way to reduce is to ingest less food. Nutrition classes are suggested to develop wholesome mental attitudes toward the attainment and maintenance of good health.

NEW ENGLAND JOURNAL OF MEDICINE

Vol. 247, November 27, 1952

* A comparison of the effect of vitamin B_{12} with that of liver extract in the treatment of pernicious anemia during relapse and for maintenance. W. P. Murphy and I. Howard.—p. 838.

Vitamin B_{12} and Liver Extract. The clinical effect of vitamin B_{12}, both during relapse and for maintenance, has been in general similar to that observed with the use of liver extract. The patients treated during relapse noticed a striking improvement in strength, appetite, and general well-being at about the time of the reticulocyte rise, as has been previously observed during liver therapy, which has been continued during the period of maintenance treatment. Severe neural disturbance, characterized by locomotor difficulty present for many years in one patient of each group, did not progress. Discomfort after the injection of either liver extract or vitamin B_{12} has occurred rarely and has not been of sufficient degree to cause more than transient concern.

NUTRITION ABSTRACTS AND REVIEWS

Vol. 22, October, 1952

* Meal habits and their effects on performance. R. C. Hutchinson.—p. 283.

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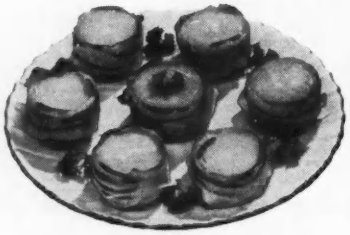

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Meal Habits. Evidence is presented that there are advantages in having small meals at short intervals instead of large meals at long intervals. It is claimed that the former arrangement promotes alertness and general well-being, while large meals generally result in a disinclination for mental or physical activity. Investigations have shown that small meals are no more effective in regard to fat, protein, and carbohydrate utilization despite a relatively longer retention in the stomach. Also, there is little support for the generally accepted hypothesis that a high-fat meal remains in the stomach longer than a high-protein meal. However, long periods between meals may result in irritability, tension, and diminished concentration, while large, infrequent meals impose a heavy burden on the digestive processes and cardiac activity. Although physical efficiency does not appear to be improved by taking food, it may be impaired if large amounts are eaten at one time. When food intake exceeds a certain amount, mental efficiency is reduced, although after a light meal mental accuracy has been shown to increase. There seems to be a relationship between work capacity and body temperature. Another favorable indication for small meals at regular short intervals is that they tend to minimize fluctuations in heat production. Investigations indicate that a six-meal daily regimen prevents the unfavorable effects of long intervals between meals and the consumption of large amounts of food.

NUTRITION REVIEWS

Vol. 10, December, 1952

* Vitamins and antibodies. A. E. Axelrod.—p. 353.

Vitamins and Antibodies. The relationship between nutrition and acquired immunity to infection is controversial, with no unequivocal evidence that any specific vitamin deficiency invariably leads to an impaired antibody production. The final word on the subject will not be obtained until it is known with certainty which cells of the body produce antibodies and what effect a specific vitamin deficiency has upon such cells. Investigators have concluded that certain B vitamins, notably pyridoxine, pantothenic acid, and pteroylglutamic acid, function in the process of antibody synthesis. The ability to control antibody production by regulating the vitamin intake should aid in determining the mechanisms of antibody synthesis. Since antibodies represent a class of specialized proteins, such studies would yield information regarding the processes of protein anabolism in general.

SCIENCE

Vol. 116, December 12, 1952

* Relationship between inorganic phosphorus and vitamin A in the rat and sheep. E. W. Klosterman, D. W. Bolin, M. R. Light, and W. E. Dinusson.—p. 665.

Phosphorus and Vitamin A Utilization. Six experiments have been conducted with rats to study a possible relationship between inorganic phosphorus and carotene and/or vitamin A utilization. The rats were depleted of vitamin A and then placed on experimental rations to which carotene in cottonseed oil was added in equal amounts to both the high- and low-phosphorus rations. The rats fed the low-phosphorus rations ate more total feed, had larger livers, and stored more vitamin A. Similar experiments were performed with sheep, the results of both groups of experiments showing a statistically significant inverse relationship between inorganic phosphorus and carotene and/or vitamin A utilization.

SURGERY, GYNECOLOGY AND OBSTETRICS

Vol 95, August, 1952

Further observations on total body water. II Changes of body composition in disease. F. D. Moore, H. B. Haley, E. A. Bering, Jr., L. Brooks, and I S. Edelman.—p. 155.

Vol. 95, September, 1952

* Ascorbic acid in surgical patients with particular reference to their blood buffy layer. I. Survey of blood and tissues J. H. Crandon, S. Mikal, and B. S. Landau.—p. 274.

* Diagnosis, treatment, and prophylaxis of potassium deficiency in surgical patients; analysis of 404 cases. H. S. Lans, I. F. Stein Jr., and K. A. Meyer.—p. 321.

Significance of the urine examination. Editorial. R. W. Lippmann.—p. 369.

Vol. 95, October, 1952

Liver blood flow, hepatic glucose production, and splanchnic oxygen consumption in normal dogs and following Eck fistula. Liver blood flow before and after splenectomy. E. B. Hallett, G. W. Holton, J. C. S. Paterson, and J. A. Schilling.—p. 401.

Ascorbic Acid in Surgical Patients. Twenty normal adults showed average ascorbic acid values of 15.2 mg. per 100 gm. white cell-platelet layer, 0.73 mg. per 100 ml. whole blood, and 0.69 mg. per 100 ml. plasma. Two hundred consecutive surgical patients had average ascorbic acid values of 14.5 mg. per 100 gm. buffy layer, 0.48 mg. per 100 ml. whole blood, and 0.36 mg. per 100 ml. plasma. In the seriously ill patient, the ascorbic acid content of tissues, buffy coat, whole blood, and plasma appears to be in a state of constant flux. Ascorbic acid deficiency in the fascia of surgical patients is better reflected by plasma than by buffy layer levels. Plasma ascorbic acid levels below 0.2 mg. per 100 ml. are indicative of tissue deficiency of ascorbic acid. Among patients having a relatively low intake of ascorbic acid over long periods, the tissue and plasma ascorbic acid may be low with a relatively high buffy layer level. The wounds of such patients show relatively good healing. When both tissue and buffy layer ascorbic acid content are low, clinical scurvy may become apparent. When they are both very low, poor healing may be evident.

Potassium Deficiency in Surgical Patients. The pathogenic factors of potassium deficiency in surgical patients were found to be: (a) limitation of potassium intake; (b) prolonged use of potassium-free parenteral solutions; (c) loss of gastrointestinal secretions; (d) increased renal excretion of potassium resulting from surgical trauma with its attendant alarm reaction, diuresis due to parenteral

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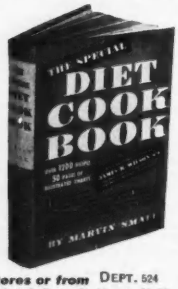

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infusions of large amounts of sodium chloride or glucose solutions, and disturbances in acid base balance. The use of gastrointestinal suction drainage, without adequate replacement of potassium, was shown to lead to a potassium deficit after four or five days. Muscular weakness was the commonest clinical finding. Anorexia, mental depression, and abdominal distention were also common. Hypochloremic alkalosis was frequently observed and responded to administration of potassium chloride. Treatment of potassium deficiency is important in the care of the surgical patient and is often essential for survival of the patient. Administration of potassium chloride intravenously was followed in most of the 314 cases reported in this paper by prompt and often striking clinical improvement.

AMERICAN RESTAURANT MAGAZINE

Vol. 37, January, 1953

* Steaming hot casseroles for icy cold days. J. A. Cline.—p. 50.
* Don't be a tax juggler. H. J. Ashe.—p. 54.
* Make your meals a memory. L. D. Freeman.—p. 68.
* Better business with breaded foods.—p. 76.
* Simplified portion control for 58 best sellers. G. L. Wenzel.—p. 98.
* There's bigger profit in better control. M. L. Jones.—p. 108.

Hot Casseroles for Wintry Days. Casserole dishes consist of a mixture of basic ingredients, flavor materials, an extender, and a sauce. Often they can be made from leftovers, and portion control is easy with individual casseroles. Variations of the casserole include the meat or poultry pie and the scalloped dish. Recipes for five casserole dishes are given.

Warning to Taxpayers. Adequate tax reserves are a "must" for the restaurateur. Too many owners depend on earnings from January 1 to March 15 of the following year for funds to settle the previous year's tax balance. Eleven types of taxes the restaurant owner must pay himself or collect and hold in trust are listed, and the author warns that accumulated tax liabilities may greatly exceed cash on hand. "Dipping into government funds" is the unlovely title given by the author to appropriation of tax reserves for personal or business use.

Memorable Meals. Eye appeal and unusual garnishes and seasonings are suggested to build restaurant business. The author gives suggestions for "glamorizing" stews, relish trays, breakfast treats, salad carts, desserts, and other attractive dishes.

Breading Methods. Consistently good breaded foods mean booming business in today's restaurants, and poor-quality breaded foods tear customer volume down quickly. Scientific research in prepared breading mixes has resulted in the following advantages: (a) fat control in frying; (b) elimination of the mess and labor of grinding crumbs, mixing batter, and assembling ingredients; (c) cost control; (d) instant preparation;

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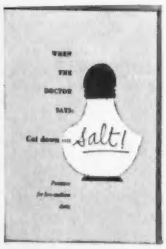
Suggest that a plate of lemon wedges be placed on the table with every meal whenever you have to impose a low sodium diet.



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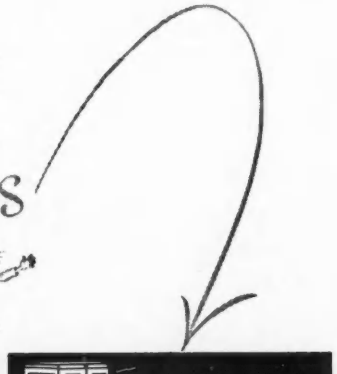

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Meat Portion Control. Veal T-bone, calf's liver, beef liver, lamb rack chops, and pork chops are analyzed for portion control in this issue. In this, eighth of a series, the author notes that his fifty-eight "best sellers" will increase net profit and build volume, provided quality and portion size are controlled and all needless waste is curtailed.

Sound Accounting Means Profit. Services of a CPA can be an invaluable aid to the small or medium-sized restaurant, which cannot afford a staff of experts on its regular payroll. Some cases in which the CPA can be of help are: inventory control; pricing for profit; internal control; checking on orders as served; records; credit rating; and tax savings. Questions to ask a CPA and ways in which to prepare for his services are suggested.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 14, January, 1953

* Tools for control of food costs. A. B. Atkinson.—p. 48.

Food Cost Control Tools. Printed forms used in the author's own food service operation are illustrated and briefly described. They are: a requisition form used in computing daily food cost; perpetual inventory forms (a physical inventory is also taken monthly to check discrepancies and verify the cost of food on hand); a purchase record form for perishables; and a special function form used also for catering occasions.

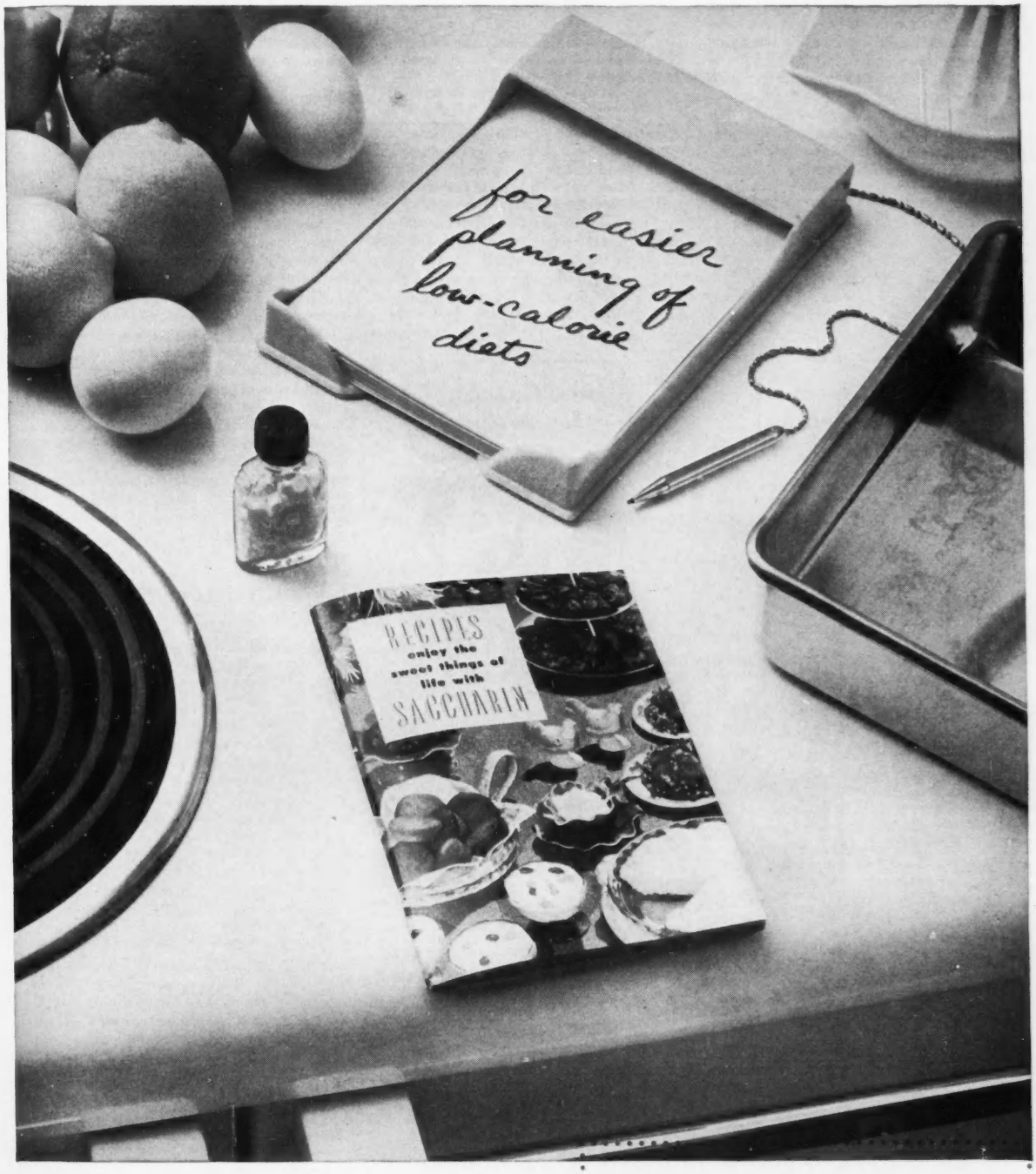
FORECAST FOR HOME ECONOMISTS

Vol. 69, January, 1953

* Emergency feeding.
  Hurricanes, floods, tornadoes, call on skills of home economists. P. Murrah and J. E. Griswold.—p. 18.
  Civil defense needs home economists, too. K. R. Smith.—p. 19.
* The chocolate story. A. D. Robins.—p. 20.

Emergency Feeding. Home economists' role in emergencies is discussed from two viewpoints: the first two authors point out the need for efficient feeding during hurricanes, floods, and other disasters; the third writes on the need for home economists in civil defense. In the first of the two articles, the work of the Red Cross in disaster relief is described. The skill of home economists plays an important part in this work, because without their advice and guidance it would not be possible to: (a) coordinate the procurement of large quantities of food; (b) maintain sanitation under disaster conditions; and (c) properly train extra personnel. In the second article are given recommendations for feeding under atomic-attack conditions. Home economists are urged to participate in their local civil defense plans at once, so that pre-attack organization may take place.

Chocolate. The great American flavor has only a sketchy history, which is traced in this article. Aztec Indians are usually associated with the origin of chocolate, and they did cultivate cacao



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on a large scale; however, evidence that the tree was native to the Amazon regions and the Orinoco Valley indicates that chocolate was carried from there to Mexico. Chocolate was brought to Spain by Cortez when he returned from America, and it became a popular drink with the European upper classes, "chocolate houses" vying with coffee houses for patronage. Modern processing of chocolate is described; i.e., cleaning, roasting, shelling, grinding, blending, conching (kneading to a fine finish), tempering, and shaping. The making of cocoa is also outlined. A table is given with analyses of six cocoa products for fat, water, protein, ash, total carbohydrates, fiber, and fuel value (calories per pound).

HOSPITALS

Vol. 27, January, 1953

* Dietary economies dependent on controlled dollar spending. E. Graham.—p. 111.
* Special dietary service for small hospitals. D. I. Anderson.—p. 114.

Controlled Spending. Dietary economies fall into four general classifications: food, labor, equipment, and supplies. Five ways in which the dietitian may conserve food money are: (a) careful planning, (b) wise purchasing, (c) accurate ordering, (d) careful portioning and cooking of meat, and (e) use of accurate portions. Economy in labor depends largely on *not* economizing on supervision and training. Labor-saving equipment must be analyzed for its particular use, i.e., an automatic bacon slicer and stacker which requires 2 hr. to clean would not be economical in a fifty-bed hospital. A job breakdown for each piece of equipment in the kitchen is recommended. Economies in supplies include: care of dishes and glasses; maintenance of plumbing so that faucets do not drip and waste water; and elimination of unnecessarily burning gas and electric lights.

Service to Small Hospitals. Helpful letters form a service being offered by the Washington State Dietetic Association to small hospitals in the state without dietitians. The letters each contain a page on menu planning, a page on nutrition or diets, a page on purchasing helps, and two recipes standardized to twenty-five servings. Articles have been written about kitchen organization, kitchen sanitation, tables of weights and measures, canned food tables, and helps to the cook. The purpose of the letters is to help superintendents who have had little background in kitchen management to control costs and food quality and to train cooks who are usually housewives with little experience in quantity cookery.

HOTEL MANAGEMENT

Vol. 62, December, 1952

* Food magic. B. Schimmel.—p. 42.

Coffee Making. The manager of an Illinois hotel describes his plan and methods for achieving coffee of good quality and flavor uniformity. Every three months he visits his coffee suppliers, where he tastes various types of beans, mixes them, and tastes the blends until they suit his sensitive palate. A delivery schedule is set up for the right amount of freshly roasted coffee to arrive each week. The method of preparation is checked as to the amount of coffee and of measured boiling water. The faucet of the coffee urn is locked for 15 min. to allow the coffee to drip through and finish. The batch is tasted before it is served. A specially marked swab is used for cleaning the urn after every three batches of coffee. The urn bags are rinsed out and soaked in cold water and allowed to dry and air after each meal.

THE HOTEL MONTHLY

Vol. 61, January, 1953

* Statler kitchen an achievement in engineering and design.—p. 53.

Efficient Kitchen Design. All operations on one floor contribute to the efficiency of the new Statler Hotel's kitchen in Los Angeles. Dining rooms are placed around the kitchen for faster service. Production flows consistently in one direction, from the starting point of a storeroom. The cooking areas, pantries, dishwashing department, and garbage disposal system are described, and a floor plan of the kitchen is shown. An employee cafeteria serves over 1800 meals a day, and a banquet kitchen is located on the banquet floor. Specialties of the kitchen include ice cream pie and other ice cream dishes as well as baked goods and

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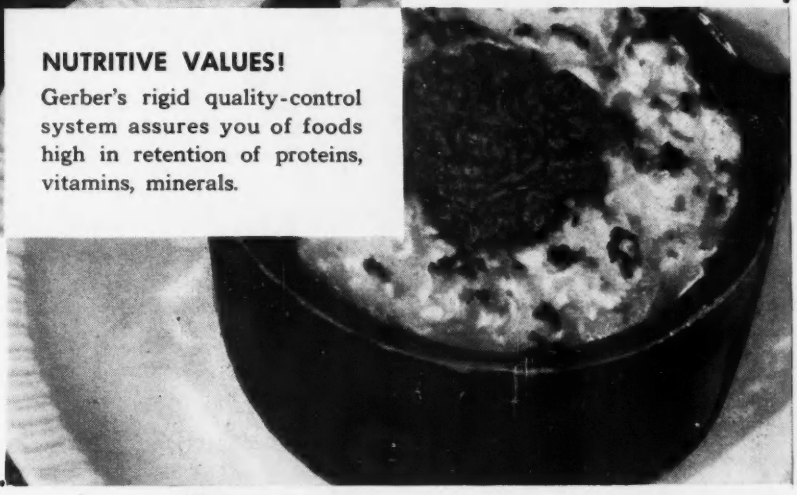

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pastries. Nine principles of good large-kitchen layout which were followed in constructing the Statler kitchen are listed.

INSTITUTIONS MAGAZINE

Vol. 32, January, 1953

* Nation needs to learn essential sanitation facts. W. H. Haskell.—p. 8.
* Bacon on a three-meal basis.—p. 24.

Sanitation Education Needed. In-service employee training programs on sanitation are all-important to proper operation of institutions. Sanitation plays a vital part in the four essential components of living (as defined by the World Health Organization, air, water, food, and shelter). American homes may benefit by the sanitation information they sadly need, through two channels: (a) training received in industry and (b) sanitation education in the school.

Bacon. Breakfast-, lunch-, or dinner-time, bacon is equally "at home." Proper storage of bacon is outlined and methods of preparing it, i.e., baked, curls, pinwheels, and so on are included, and its use as a garnish is also stressed.

THE MODERN HOSPITAL

Vol. 80, January, 1953

* Ah-er-uh—"unaccustomed as they are" they should take lessons. L. W. Johnson.—p. 60.
* Save those steps and save time and money. G. Blumenauer.—p. 112.
* There is profit in the nonprofit cafeteria for medium-sized hospitals, too. N. H. Radell and E. Irwin.—p. 116.

Attention, Public Speakers! Monotony, complex "gobbledygook" English, and lack of enthusiasm characterize too many speeches made before medical and hospital organizations. "If you can't sell it," the author quotes an advertising axiom, "it's worthless." Ideas, services, and personalities must be "put over" by speakers who can make their points interesting and easily remembered. Most college courses in public speaking lack criticism, the author notes; without this feature, one may repeat the same faults innumerable times without correction. Toastmasters International, an organization with nearly a thousand clubs throughout the world, designed to teach people to think and speak on their feet, is suggested by the author as a possible help to students of hospital administration.

Saving Steps. Economy in time and money is the result of proper kitchen planning. An architect discusses layout of two hospital food service operations and emphasizes that often seemingly minor changes in a plan may result in major improvements in operating efficiency.

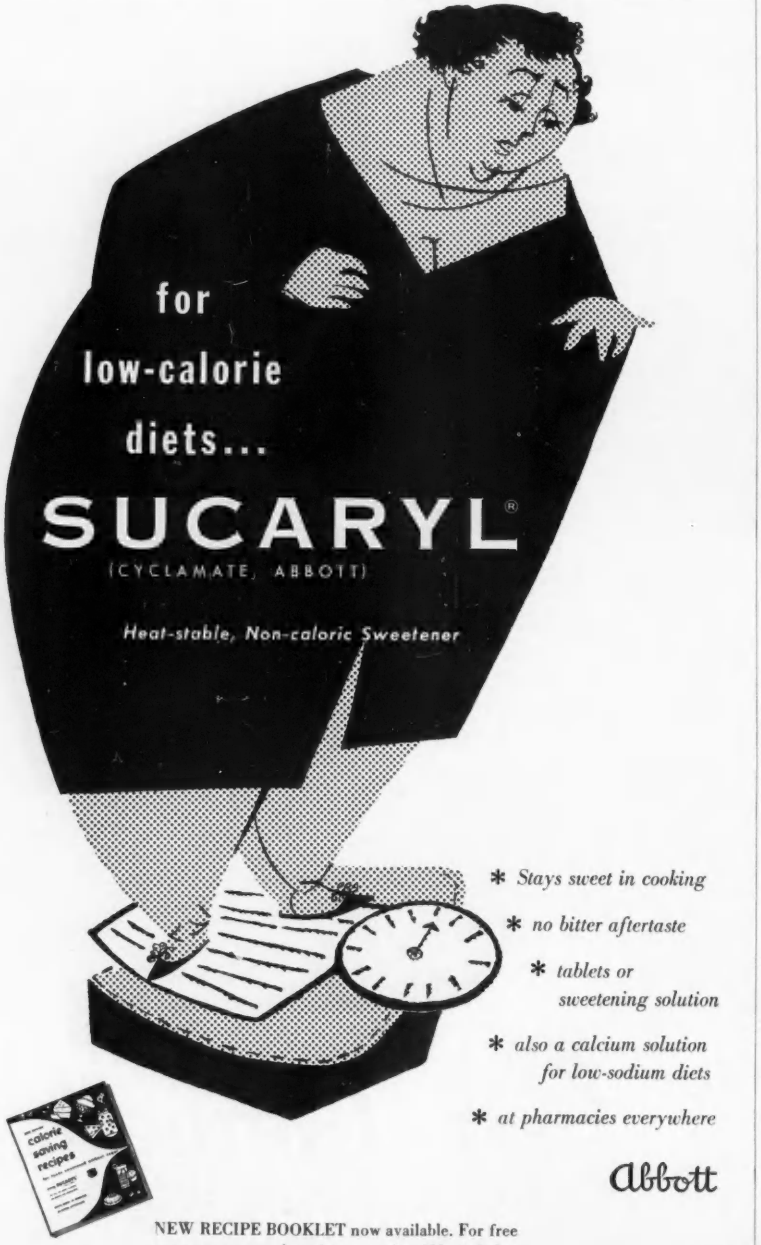
Nonprofit Cafeteria. Eight employee cafeterias in medium-sized and small hospitals have changed over to a pay basis. From both the management's viewpoint and the employees', the change has advantages. Problems to consider in making such a change are discussed and the problem of food cost control is covered. A kitchen order form and a daily food cost report are illustrated, and steps in finding the percentage cost of food are listed.

PERSONNEL JOURNAL

Vol. 31, December, 1952

* Dollars and sense in personnel administration. J. R Clarke.—p. 242.

Personnel Administration Promotes Economy. Personnel activities should not be confined to areas of employment and employee service; the personnel department can make a large contribution to the financial success of a business and thereby realize its true purpose, i.e., make the business show more profit. A few areas within which the personnel program can operate toward greater economy are: (a) reducing the cost of unemployment compensation; (b) reducing waste due to payment of irregular or dishonest workmen's compensation claims; (c) promoting employee participation in a suggestion system; (d) analyzing reasons for turnover and absenteeism; (e) careful selection of employees and job operations for productivity; (f) carefully reading union contracts; (g) reducing overtime by combating conditions which produce the need for it; and (h) "middle-of-the-road" wage administration, neither over nor underpaying. In some cases, personnel men are considering activities involving human beings as the objective rather than the *means* to the true objective—a more effective total operation.



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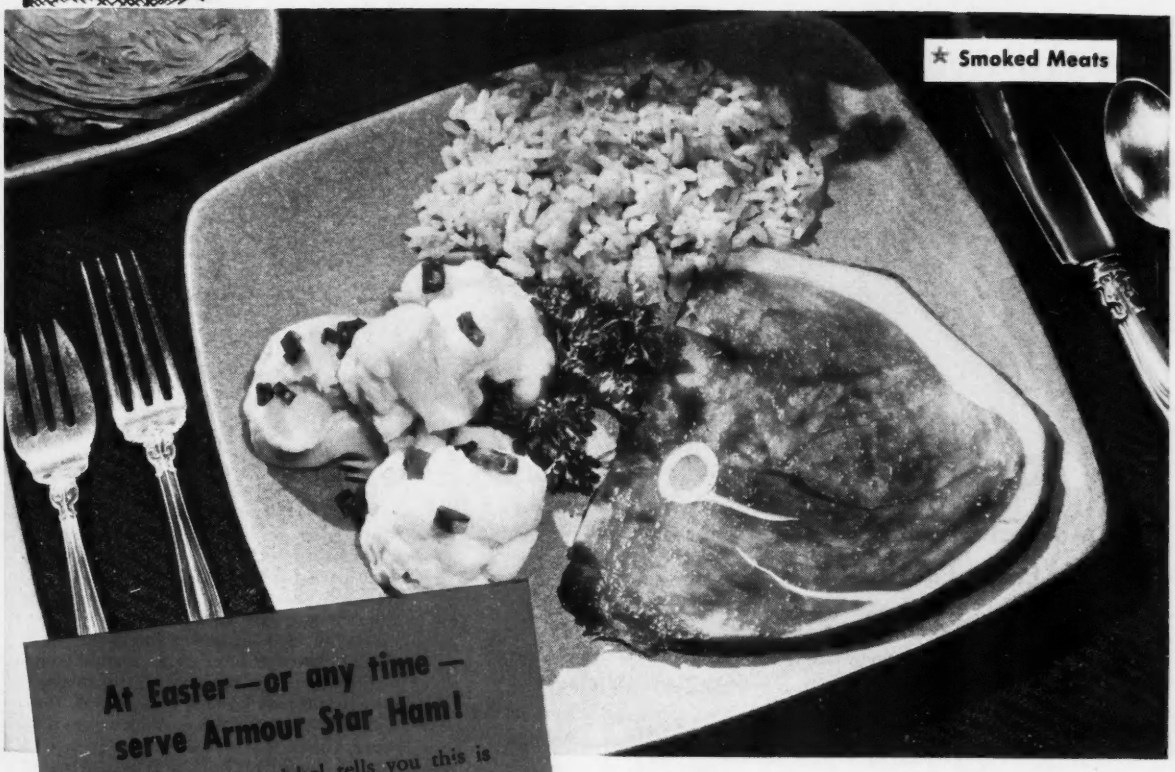

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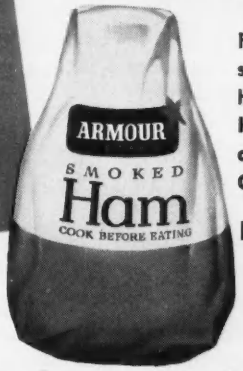

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RESTAURANT MANAGEMENT

Vol. 71, December, 1952

* Significant trends.—p. 7.
* New trends.—p. 13.

Vol. 72, January, 1953

* Take-home dishes for dinner meals. A. Easton.—p. 36.
* Modern miracles with fresh vegetables and fruit. P. P. Logan.—p. 40.

Employee Recruitment. In reviewing the employee shortage, one Illinois restaurateur said that he had had considerable success hiring housewives as waitresses with the understanding that they work only every other night. This gave them the opportunity of maintaining their homes.

New Trends. Recent experiments have shown that monosodium glutamate improves the flavor of frozen poultry, meat, fish, and vegetables and that its addition aids in retention of quality during storage. . . Consumer purchases of frozen orange juice concentrate have been greater than purchases of fresh oranges. . . High pitched sound kills germs so effectively that it can be used to purify water and sterilize milk. . . Powdered vinegar is more expensive than liquid vinegar. Yet, for the Armed Forces it is economical because of the great saving in overseas shipping costs. . . Experimentation has been conducted on prefrying thinly sliced bacon for shipment to the Armed Forces.

Take-Home Dinners. Television, working homemakers, and other facets of modern life have caused many restaurants to develop the take-home dinner. One-dish meals, such as casseroles, are most adaptable to this trade. People like foods which can be eaten with a fork alone, particularly if eaten when watching television, and disposable containers are preferred. Forty-four suggestions for "meal-in-a-dish" take-home dinners using meat, "meatless dishes," fish, and poultry are listed, and in addition, five low-priced and five medium-priced meals consisting of two or more foods are suggested.

Fresh Fruits and Vegetables. Produce was spotlighted for the average American with the advent of the "Basic Seven" list in 1941. Fruits and vegetables are also more easily obtainable now, due to modern progress in harvesting, handling, shipping, and storage. Vegetables are discussed individually as to factors of quality, and methods of keeping them fresh and palatable are described, as well as proper cooking. Fresh fruits are classified as to family and then discussed individually for quality factors. A comprehensive chart is included showing the seasons in which fresh fruits and vegetables are available in various regions, with a map which clearly defines these areas.

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And you'll gain additional savings in time and labor because Arrowhead is light weight, easy to handle and easy to wash. Safe in automatic dishwashers and boiling water, it passes the most rigid sanitary standards.

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A complete line in five lovely pastel shades.
Write for color catalog.

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WHAT'S NEW IN HOME ECONOMICS

Vol. 17, January, 1953

* Modern mixes and methods for class menus.—p. 46.

Vol. 17, February, 1953

* United Nations food unit. Part one. A. Small and L. Norfleet.—p. 66.

Modern Mixes and Methods. Bins, bushels, and barrels of staple foods, so necessary to our grandmothers, have been "shoved off the shelf" of the modern pantry to make way for mixes, frozen products, and all the canned, packaged, and dried items which are products of today's technology. Home economics teachers, aware of the increased "busyness" of the homemaker and the decrease in kitchen and family size, should adapt their teaching to include the modern, easily-prepared foods with which their students will deal later. Suggestions for a breakfast, lunch, and dinner prepared from ready-to-cook and pre-prepared foods are given. A partial list of such foods is also included.

Study of Foreign Foods. To give ninth grade students an appreciation of the purposes of the United Nations and an understanding of other peoples, food was chosen as the vehicle for learning. Each student was made responsible for the complete background of one member nation of the United Nations. In this first part of a two-part report of the total project, the goals of the project are outlined, as well as the development of the unit in three phases. Included in the goals is development of skill in making typical foods of other nationalities and learning foreign terms and how to read foreign cookbooks. Emphasis was put on understanding both familiar and unfamiliar foreign foods.

You can't miss pleasin' with PINEAPPLE UPSIDE-DOWN CAKE!

Look how the Canned Pineapple Industry's national magazine ads for March feature Pineapple Upside-Down Cake! Baked with Canned Pineapple, these cakes are a tempting way to give your menus more glamor. And like all Canned Pineapple dishes, they're quick to prepare and serve, because this tropic-fresh fruit is ready to use right from the can!

New quantity recipes for Pineapple Upside-Down Cake and other appealing Pineapple Cakes—tested and approved by the American Institute of Baking—are ready and free for the asking! Write for yours today to the Pineapple Growers Association, 215 Market Street, San Francisco 5, California.

Easy ways to perk up meals with NATURE'S MOST REFRESHING FLAVOR!

And watch folks welcome PINEAPPLE SALADS!

Here's another way to enjoy Nature's most refreshing flavor — in Pineapple Salads, as featured in April Canned Pineapple Industry ads. There are scores of ways the chef can fix inviting salads with versatile Canned Pineapple. All 5 ways it's canned, in fact, this useful fruit gives a flavor lift to salads, meats, desserts. And the convenient forms make portion control easy. Be sure there's plenty of Pineapple Juice and Canned Pineapple fruit cuts (Slices, Chunks, Tidbits and Crushed) on hand!

P.S. **Canned tropic-fresh, Pineapple Juice makes a healthful, refreshing drink round the clock. Serve it with pancakes during Lenten "Pancake Days"!**

News Notes

Venture to the West. Since La Salle, De Soto, and Lewis and Clark found such driving satisfactions in exploring the central and southwestern areas of our country, presumably there is something to recommend exploration. Even though one may not be the first to plant his state's flag on some majestic peak, he can still experience deep pleasure in having discovered it for himself.

Such being the case, this column seeks merely to suggest that those who attend the Annual Meeting in Los Angeles explore one of the many areas of scenic beauty.

Leading to a cluster of natural wonders in the western area of our land is a route which takes one through the natural gateway to the West, the Royal Gorge of Colorado, with its almost perpendicular red rock walls, spanned by the world's highest bridge. Before leaving this state, one will see majestic mountains and spectacular peaks, including that named for Lt. Zebulon Pike, and "The Garden of the Gods," a region of strikingly colored rock formations.

Five scenic regions, each dissimilar to the others but having its own distinctive character and coloring, are grouped within easy reach of one another and can be visited on a single tour. They are the Grand Canyon and Kaibab Natural Forest in Arizona, and Zion National Park, Bryce Canyon, and Cedar Breaks National Monument in Utah.

Most overwhelming in its magnitude is the Grand Canyon, breathtaking because of its ever-shifting symphony of colors and its gigantic architectural forms. It has been estimated that all of the peoples of the world could be packed into this colossal chasm which is 280 mi. in length, 1 mi. deep, and 12 mi. wide.

Kaibab, which in Piute Indian means "mountain-lying-down," is a vast plateau covered with the greatest unbroken stand of virgin pine in the United States. Reminiscent of the sylvan setting of Sherwood Forest, it is populated by black-tail mule deer and the unique white-tail squirrel.

Bryce Canyon, of horseshoe shape, is a vast panorama of medieval spires, cathedrals, bridges, and castles, created by nature in flame and golden color. Cast in limestone, the Canyon is 2 mi. wide and 3 mi. long.

Cedar Breaks National Monument has been described as a fitting dwelling place for prehistoric monsters. Called the "circle-of-painted-cliffs" by the Indians, this series of vast amphitheatres is characterized by its enormous dragon-like formations of pure white and its immense sprawling forms resembling burgundy-red dinosaurs.

To the many who have covered these trails, Zion is the favorite of nature's imaginative caprices. Sublimity is the word which describes its cloud-reaching stone monuments, cloaked in pastel hues. Its Great White Throne rises 2475 ft. above the river at its base. This towering butte ranges in color from red at its base to rosy buff and finally to gleaming white. The Great Organ, Angels Landing, and the Throne are seen most effectively from the Temple of Sinawava, a green, park-like area.

To the southeast lies the Painted Desert, and within it is located the Petrified Forest, the ghostly relic of trees which were killed by some ancient flood and turned to stone.

After viewing these natural wonders, one would be remiss not to visit Hoover Dam, one of man's inspiring engineering feats. Close by is Lake Meade, the world's largest artificial lake.

Not many miles toward the sinking sun, its slender length bathed by the Pacific, stretches California.

Hawaiian Tours. Tourist flights to Hawaii are being offered by Pan American World Airways and United Airlines beginning this month. Sales representatives of both airlines urge A.D.A. members to make their reservations soon so that accommodations may be assured. Names and addresses from which information may be obtained appeared on page 74 of the January issue.

Filmstrip on Nutrition Education. "Let's Teach Better Nutrition," a 35-mm. color filmstrip, describes the nutrition education research activities of the Harvard School of Public Health's Department of Nutrition in the public schools of: Newton, Massachusetts, Rutherford County, Tennessee, and Ascension Parish, Louisiana. This filmstrip has been prepared for school personnel, parent-teacher groups, and community workers to demonstrate how a school community may develop a nutrition education program. It is available as a filmstrip or slides with or without sound. It may be borrowed with no cost except that of transportation, for a one-week period from the Department of Nutrition, Harvard School of Public Health, 695 Huntington Avenue, Boston 15. It is also available for purchase.

Dr. Todhunter in New Position. Dr. E. Neige Todhunter, Speaker-Elect of the House of Delegates, A.D.A., recently became Dean of the University of Alabama's School of Home Economics. Dr. Todhunter, formerly Head of the University's Department of Foods and Nutrition, has taken a prominent part in many A.D.A. activities, including the chairmanship of the JOURNAL Board. She has written extensively for the JOURNAL and other professional publications.

Low-Sodium Diet Literature. "Preparing Meals for the Sodium-Restricted Diet" by the Diet Therapy Committee of the Illinois Dietetic Association, is a twelve-page, mimeographed compilation containing: general information about low-sodium cookery, menus, and recipes for low-sodium dishes. Some of the ideas and suggestions are taken from material presented in a series of demonstrations given during the winter of 1951–52 as a joint project of the Chicago Heart Association, the Chicago Dietetic Association, and the Chicago Home Economists in Business. The booklet is for sale to physicians and dietitians only, for 10 cents per copy from Mame Dentler, 303 East Chicago Avenue, Chicago 11, Illinois.

Kansas Medical Center Booklet. Hospital patients at the University of Kansas Medical Center are being greeted these days with an attractive twelve-page booklet titled "At Your Service." The booklet, illustrated with brightly colored vegetables, bread, and fish, describes the Medical Center's Dietary Department and presents advice to the patient on eating while in the hospital and at home.

Summer Courses. Two four-week courses in home economics will be offered by the University of Illinois beginning June 22. These courses, which may be used in meeting requirements for A.D.A. membership, are: Problems in Group Feeding, which will give emphasis to school lunch programs; and Institution Management. Further information may be obtained by writing to the Department of Home Economics, University of Illinois, Urbana.

Plentiful Foods. The U.S.D.A. lists the following foods as expected to be in plentiful supply during March:

Fruits and vegetables	
Beans, dry baby Limas	Figs, domestic dried
Beans, pea	Oranges, fresh and processed
Cabbage	Raisins
Grapefruit, fresh and processed	
Protein foods	
Buttermilk	Eggs
Cheese, Cheddar	Haddock
Cheese, cottage	Milk—nonfat dry solids
Chickens—broilers and fryers	Perch, ocean
Cod, frozen	Turkeys
Other foods	
Butter	Peanuts and peanut butter
Honey	Shortening, vegetable
Lard	
Margarine	
Salad oils	

FAO News. At the request of the Iraqi government, the Food and Agriculture Organization of the United Nations sent Prof. Hugues Gounelle to ad-

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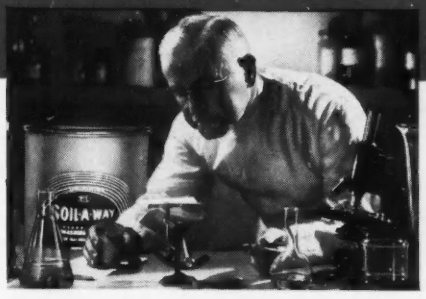
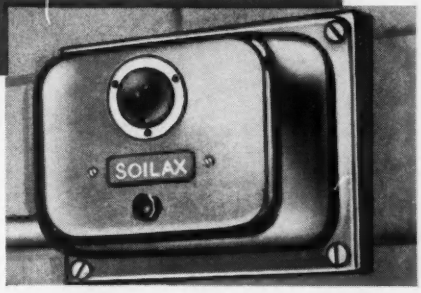


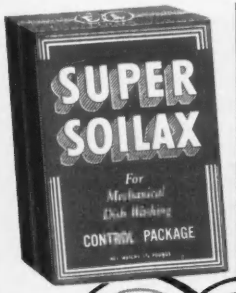


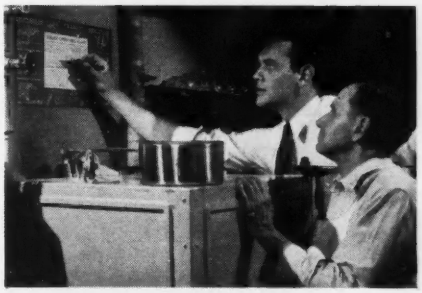
PRODUCT QUALITY. SOIL-A-WAY, for mechanical dishwashing under adverse conditions, is a typical example of a top quality compound developed for a specific use. Contains special polyphosphates which prevent film forming on china or silver. Detergent-action removes soil from dishes; washes them clean, bright, *sanitized!*

BETTER RESULTS because of automatic control with the G-3 ELECTRONIC DISPENSER! New scientific dispenser automatically tests wash water concentration and adds just the right amount of compound when wash solution becomes diluted. Eliminates guesswork and waste. Assures best dishwashing results at lowest cost!

SOILAX SERVICE. Periodic service on how to get the best results from your equipment. A nation-wide staff of capable Kitchen-Engineers stands back of every product ready to help boost your dishroom efficiency. They are thoroughly trained in all phases of dishwashing.

PERSONNEL TRAINING. Here's on-the-job instruction that keeps your dishwashing crew on their toes and your dishroom running smoothly. Complete reports on your dish department keep you up to date and prevent waste. It's another Economics Laboratory exclusive service!





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vise on nutrition problems. As a result of his work, the Ministry of Social Affairs has now established a Nutrition Institute in Baghdad for the purpose of conducting research and spreading knowledge of good food habits. Three fellowships will be granted by FAO to an Iraqi doctor and two biochemists for a year's specialized training in Europe. A biochemistry laboratory and a twenty-bed hospital will be set up at the Institute. Other steps to improve the people's nutrition include a school feeding system, and a program to increase food supply through improved agricultural management.

WHO News. Dr. M. G. Candau, Assistant Director, Pan American Sanitary Bureau, Regional Office for the Americas of the World Health Organization, has been nominated as Director-General of The World Health Organization. This nomination is subject to confirmation by the Sixth World Health Assembly, to convene in Geneva on May 5. Dr. Candau, who has been Assistant Director of the Bureau since March 1952, will replace Dr. Brock Chisholm, whose five-year term as Director-General expires on July 21.

Government Publications. *How to Cook Shrimp*, by Jean Burtis and Rose G. Kerr, has been released as Test Kitchen Series No. 7 of the Fish and Wildlife Service, Department of the Interior. The booklet contains instructions on boiling shrimp both before and after peeling, and recipes for shrimp cocktail, cocktail sauces, and twenty-five other shrimp dishes. Photographic illustrations are liberally used. It may be obtained from the Government Printing Office, Washington 25, for 15 cents a copy.

"Know the Poultry You Buy," by the Poultry Branch, Production and Marketing Administrations, U.S.D.A., is a large poster showing the official grade and inspection marks used for poultry by the government. Pictures of Grade A and Grade B chickens are shown, as well as pictures of five types of packaged poultry with different labels. This poster may be obtained from the Government Printing Office for 10 cents each.

Pointers on Freezing Yeast and Quick Breads, Pies, Cookies, and Cake is the title of a three-page mimeographed release of the Bureau of Human Nutrition and Home Economics, U.S.D.A. Suggestions are given for obtaining good quality in frozen biscuits, muffins, baked yeast rolls and bread, unbaked dough, pies, cookies, cakes, frostings, and fillings. Instructions for wrapping baked goods for freezing are also included. This publication is available on request from the Office of Information, U. S. Department of Agriculture, Washington 25.

Another Bureau of Human Nutrition and Home Economics publication is *Quantity Recipes Using Honey*, released as HNHE-105. This thirteen-page booklet contains seven recipes, scaled to three quantity sizes, for: honey chocolate cake, honey drop cookies, honey pecan tarts, honey prune bread, honey-cream cheese sandwich filling, honey punch, and honey-chocolate milk. This publication is also obtainable on request from the Office of Information, U. S. Department of Agriculture, Washington 25.

Food and Container Institute. Joseph Cryns, Baking Technologist of the Quartermaster Food and Container Institute for the Armed Forces, was presented with the Annual Award of the Research Director of the Quartermaster Corps' Research and Development Division for his successful development of "Wheat Base." This new product is a heat-stabilized fraction of whole wheat flour which may be stored for as long as a year at 100°F. Before Wheat Base was developed, the extremely limited stability of whole wheat flour (six weeks during the summer months) had prevented the issue of food products containing whole wheat in the overseas B-ration. Now servicemen may be provided with typical whole wheat bread, muffins, and other items, by the recombining of Wheat Base with white flour.

Lt. Col. George F. McAneny has been appointed the new commandant of the Chicago Quartermaster Food and Container Institute for the Armed Forces. He relieves Lt. Col. Charles A. Shaunesey, now with the Far East Command.

Nutrition Foundation News. Dr. Horace L. Sipple, Director of Research and Education, Evaporated Milk Association, Chicago, has been appointed Executive Secretary of the Nutrition Foundation, Inc., to succeed the late Ole Salthe. Dr. Sipple, who has served in his present position since 1945, was formerly a research chemist and food technologist for the American Can Company.

Booklet on Normal Diet. *A Balanced Diet*, a twenty-three-page booklet by Dr. Fredrick J. Stare, Lucille J. Bowser, and Dr. Martha F. Trulson of the Harvard School of Public Health's Department of Nutrition, has recently been issued by the Nutrition Foundation, Inc. In addition to discussing requirements for an adequate diet in general, the booklet contains menus for a week, tables of desirable weights for men and women, and six additional menus made up of only cold foods, "debunking" the theory that a meal must be hot to be balanced. *A Balanced Diet* may be obtained from the Nutrition Foundation, Inc., Chrysler Building, New York 17, for 25 cents a copy.

Rose Simmonds Memorial Fund. The British Dietetic Association is launching an appeal for the endowment of a Memorial Fund in memory of the late Rose Simmonds, noted English dietitian. The purpose of the Fund will be promotion of undergraduate and postgraduate education in dietetics. Contributions to the Memorial Fund should be sent to the Treasurer, British Dietetic Association, 251 Brompton Road, London S.W. 3.

National Vitamin Foundation Meeting. The annual meeting of the National Vitamin Foundation was held

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pours perfectly—from every angle.

There is much to be said for this attractive, new Polar Ware beverage server with the no-drip feature. Handled carefully or carelessly, it always pours perfectly — an advantage particularly appreciated by uncertain convalescents. And because this individual 10-ounce server has no spout, it makes trays less crowded and easier to load. What's more, washing is easier, too . . . for with no spout to contend with, the pot with cover open, rides firmly on the tray or conveyor belt of your washing machine.

Ask the men who call on you about this new beverage server for the diet kitchen that's ruggedly made in one piece of heavy gauge stainless steel, with hinged cover. You'll find that leading supply houses everywhere carry Polar Ware.

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March 4 in New York City. The program of the Scientific Session included the following speeches:

"Newer Knowledge of the Metabolism of Tocopherols in Human Tissues"—Karl E. Mason, University of Rochester (New York) School of Medicine and Dentistry

"Studies on the Functions of Vitamin B_6"—E. W. McHenry, University of Toronto School of Hygiene

"Vitamin A Metabolism in Health and Disease"—B. M. Kagan, Medical Research Institute, Michael Reese Hospital, Chicago

"Neuropathology in Vitamin B_{12} Deficiency"—W. F. Alexander, St. Louis University School of Medicine

"The Experimental Production of Niacin Deficiency with Emphasis on Liver Pathology"—M. K. Horwitt, Biochemical Research Laboratory, Elgin (Illinois) State Hospital

"Folic Acid and Citrovorum Factor in Human Nutrition"—William J. Darby, Vanderbilt University School of Medicine, Nashville, Tennessee

"Vitamin B_{12} and Antibiotics in Child Growth"—Nevin S. Scrimshaw, Institute of Nutrition of Central America and Panama, Guatemala City

"Vitamin B_{12} as a Growth Factor in Undernourished Italian Children"—Roberto Funaro, Nutrition Clinics Fund, New York City

"Nutrition in Pregnancy"—W. T. Tompkins, Pennsylvania Hospital and Philadelphia Lying-In Hospital, Philadelphia

Ideal for Therapeutic Diets

Pears Please!

patients, too . . . serve creamy-white canned Bartlett Pear halves for breakfast . . . or as a simple luncheon dessert.

Combine them with smooth cottage cheese in tempting salads . . . perfect with gelatin, too . . .

Pears are very adaptable in the bland diet. They are also important items in the salt-free diet, and in the treatment of obesity.

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Meetings. The *Southeastern Hospital Conference of Dietitians* will be held in New Orleans, April 8 through 10.

The annual meeting of the *American Home Economics Association* will take place June 23 through 26 in Kansas City, Missouri.

Eva Mae Marks. The A.D.A. office has received word of the death of Eva Mae Marks in Washington, D. C., on December 27. Miss Marks, Chief Dietitian at Gallinger Hospital in Washington, became an A.D.A. member in 1931. In 1938, she became a life member. Miss Marks was honored in November 1952 for her twenty-one years' service to the hospital during brief bedside ceremonies.

News of State Associations

Arizona Dietetic Association. Members of the Arizona Dietetic Association, medical record librarians, and physiotherapists met jointly with the Arizona State Hospital Association from February 12 through 16.

Connecticut Dietetic Association. Newington was the scene of the *Northern Connecticut Dietetic Association's* December dinner meeting. Lydia Hewes, Director of Public Relations, Hartford Hospital, was guest speaker. In January, the group met at Hartford Hospital to hear Dr. Gerald Pitegoff, Mount Sinai and Hartford Hospitals, discuss "Modern Concepts of Purine Metabolism." The February meeting included a tour of the Connecticut Light and Power Company in Hartford, and a talk by Dr. Martha Trulson, Harvard School of Public Health, Boston. This month's meeting is the first of its kind for this Association: a meeting for nonprofessional food supervisors and dietitians' aides. An educational film will be shown and a representative of the Connecticut Department of Education will talk on "Needs of Employees."

Meriden Hospital will be host to the group on April 9. Howard Saviteer, Administrator, has been tentatively scheduled to speak. Bertha Nettleton, formerly of General Foods Corporation, will address the group on May 7 on "The Trained Dietitian—Her Contribution to the Development of Food Service." The meeting will be held at the Phoenix Insurance Company in Hartford.

Nebraska Dietetic Association. The annual convention of the Nebraska Dietetic Association was held in Lincoln on October 29. Dr. Richard M. Bourne, Associate Professor of Economics and Labor Relations, presented a talk, "Do You Hire People?" Margaret Cowden Bernard, Council of the House of Delegates, A.D.A., discussed Association affairs.

Officers of the Nebraska Association are: President, Marion Keller, United Benefit Life Insurance Company, Omaha; President-Elect, Betty Jean Yapp, Mary Lanning Hospital, Hastings;

For just pennies per portion

Here's the story, simple and short:

When it comes to desserts, there are literally *hundreds* of high-quality dishes you can prepare with Jell-O Puddings and Pie Fillings—for just pennies per portion!

Here's a good example—Lemon Pineapple Angel Cake. And there are many, many more easy-to-fix desserts and salads in the booklets offered elsewhere on this page.

You just can't go wrong on Jell-O *quality* dishes! It's food like this that brings customers back to your restaurant over and over again. And it's food costs like these that let you still earn good profits on high-quality items.

LEMON PINEAPPLE ANGEL CAKE

3½ pounds canned crushed pineapple (juice included)
10 (2 cups) eggs, slightly beaten
1 quart cold water
5 pounds Jell-O Lemon Pie Filling
5¼ quarts boiling water and pineapple juice
2 cups heavy cream, whipped
6 baked 10-inch angel food cakes

Drain pineapple, reserving juice for part of the liquid. Combine and cook eggs, liquid, and pie filling; mix as directed for pies on Jell-O Lemon Pie Filling package. (Use 10 whole eggs instead of the 15 egg yolks specified on package.) Remove from heat as soon as mixture boils.

Divide mixture in two parts. To one part, add drained crushed pineapple; chill. Chill second part, then fold into whipped cream.

Split cakes in half crosswise. Spread about 2⅔ cups of the lemon-pineapple filling on bottom half of each cake. Cover with top half, and spread about 3 cups of lemon-cream topping over entire cake. Chill thoroughly.

JELL-O PUDDINGS and PIE FILLINGS!

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Secretary, Ruth E. Johnson, Lincoln General Hospital, Lincoln; and Treasurer, Doris M. Spragg, University Hospital, Omaha.

New York State Dietetic Association. A "Leadership Handbook" has been compiled by the New York State Dietetic Association for use of officers, section chairmen, delegates, and committee chairmen in interpreting their constitution and in carrying out their respective duties. Detailed procedures and responsibilities for each office are outlined, and a calendar of annual duties is included. The manual was revised and mimeographed last September.

The *Buffalo Dietetic Association* met in October to hear the administrator of the DeGraff Memorial Hospital, speak on "The Role of the Hospital in a Small Community."

Members of the *Central New York Dietetic Association* in October heard a talk on "The Place of the Dietitian on the Medical Team" by Dr. William R. Willard, University of the State of New York, Syracuse. In December, Grace White, Professor of Medical Social Work, discussed "The Person and His Food Habits."

The *Hudson Valley Dietetic Association's* first fall meeting, held in Troy in October, featured a talk on "Current Research in Nutrition" by Dr. Rudolph E. Fremont, VA Hospital, Albany. Two members of this Association participated in a panel discussion on "In-Service Training for the Case Worker" at a meeting of the New York State Association for Nutritionists and Home Economists in November.

At the *Mid-Hudson Dietetic Association's* October meeting, Dr. Albert Mazzeo discussed the food handlers' training program begun in Newburgh last fall.

The Diet Therapy Committee of the *Rochester Dietetic Association* cooperated with the local medical association in the annual Diabetes Detection Week campaign. Dietitians displayed posters in many Rochester hospitals, and one dietary department offered a consultation service in the hospital waiting room.

Oklahoma Dietetic Association. Members of the Oklahoma Dietetic Association held their annual fall business meeting at the University of Oklahoma's new Home Economics Building in December. A tour of the building and of the year-old kitchens of the Student Union Building followed the meeting.

The Professional Education Section of the Oklahoma Association is working on an exhibit for the convention of the National Congress of Parents and Teachers in May in Oklahoma City.

The Oklahoma Dietetic Association has presented two sets of torsion scales to the Oklahoma Medical Research Foundation Hospital, which has recently been built in connection with the University of Oklahoma Medical Center.

The Association is planning for its spring convention, March 27 and 28, in Oklahoma City.

Officers for 1952–53 of the Oklahoma Association are: President, Mary Campbell Zahasky, University of Oklahoma Hospitals, Oklahoma City; President-Elect, Mary Bolton Morris, Chickasha; Secretary, Mabel A. Walker, Oklahoma A. & M. College, Stillwater; and Treasurer, Kathleen Stowell Atha, Oklahoma Natural Gas Company, Tulsa.

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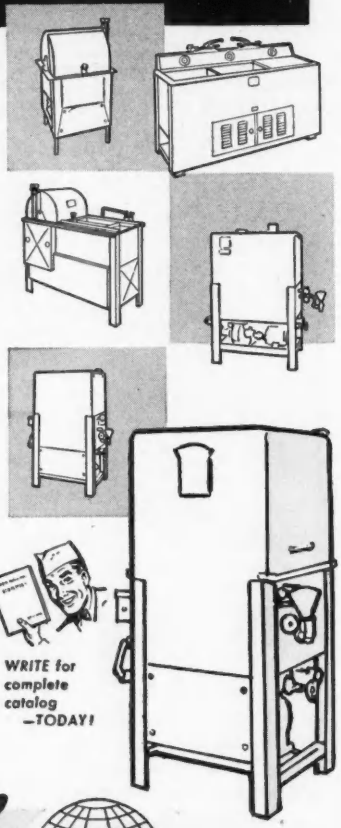

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Association Activities

Our Representatives. National representatives attending state dietetic association meetings this month are:
March 12–13—Beulah Hunzicker, Illinois Dietetic Association, Chicago.
March 27–28—Cora E. Kusner, Oklahoma Dietetic Association, Oklahoma City.
March 27–28—Grace Bulman, Kentucky Dietetic Association.

A.D.A. Exhibits. The Council on Industrial Health of the *American Medical Association* held its thirteenth Annual Congress January 20 to 22 in Chicago. The A.D.A. exhibit, "Achieve Your Proper Weight and Keep It," was displayed, along with literature relating to industrial feeding. Martha J. Moffit of the Chicago Dietetic Association acted as exhibit chairman, and was assisted by other members of the Chicago Association.

Miss Moffit again served as chairman when the same exhibit was displayed at the midwinter meeting of the *Chicago Dental Society*, February 9 to 11.

A.D.A. exhibited also at the *American*

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Don't stop with that breakfast dish of Prunes. Discover the *many* ways Prunes' sunshiny flavor adds interest and variety to all *three* meals. As a start, we hope you will try some of the menus below. They have proved popular *and* practical in hospitals, schools, and other institutions all over the country.

Breakfast	Luncheon and Supper	Dinner
Spiced Prunes with Lemon Slice (add cinnamon, nutmeg and lemon slices to Prunes while cooking) Scrambled Eggs with Shredded Dried Beef Buttered Toast	Chicken Noodle Soup Baked Hash with Poached Egg Lettuce Salad Butterscotch Pudding topped with Spiced Prunes	Vegetable Soup Scalloped Oysters Country Fried Potatoes Wilted Lettuce Prune Cake with Whipped Cream
Chilled Canned Apricots Hot Wheat Cereal Crisp Bacon Prune Coffee Cake or Muffins	Clam Chowder Toasted Cheese Sandwich Mixed Vegetable Salad Prune Upside-Down Cake	Chilled Apple Juice Pot Roast cooked with Potatoes, Onions, Carrots, Celery Gravy Hot Biscuits Prune and Cottage Cheese Salad Coffee Bavarian Cream
Tomato Juice Hot Oatmeal with Chopped Prunes Baked Egg Toasted English Muffin	Creamed Tuna on Crisp Chinese Noodles Celery — Pickles — Olives Prune Bread and Butter Strawberry Sundae	Roast Duck with Prune Stuffing Gravy Baked Squash Buttered Mixed Vegetables Lettuce Wedges with 1000 Island Dressing Lemon Sherbet Oatmeal Prune Cookies
Chilled Prune Juice Poached Eggs on Toast Little Pig Sausages	Baked Beans with Ham Brown Bread Chopped Cabbage Salad with cubed Bananas and chopped cooked Prunes Tapioca Pudding with Chocolate-Mint Sauce	Minute Steaks Potatoes Hashed in Cream Pea and Corn Succotash Cabbage Salad with Parsley and Green Onion Jellied Prune Whip with Custard Sauce
Cooked Prunes on Corn Flakes Soft Cooked Eggs Cinnamon Toast	Vegetable Soup Chicken or Turkey Salad Prune-Peanut Butter Sandwiches Hot Apple Pie	Meat Loaf with Mushroom Sauce Scalloped Potatoes Buttered Corn Molded Fruit Salad Prune-Rice Pudding

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You get essential A and B vitamins in full measure—plus all the minerals and other health benefits California Prunes provide so abundantly.

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Management Association's annual meeting in Chicago, February 16 to 18.

Prize Winner. The 1952 first prize winner of the A.D.A. Second Annual Photographic Contest appeared on the cover of the February 1953 issue of *Practical Home Economics*.

A.H.A. Institute. The American Hospital Association is holding an Institute on Dietetics the week of March 9. A.D.A. and the Illinois Dietetic Association cooperated in this Institute.

Trichinosis Conference. The National Conference on Trichinosis was held in Chicago in December. Abstracts of the papers, which were concerned with education, research, and control of the disease, are available from the Lulu G. Graves Memorial Library in the A.D.A. office upon request by members.

Library Committee. The A.D.A. Library Committee has been meeting to review and revise materials available from the Library. There are approximately five hundred books catalogued in the Library which are available only for reference in the A.D.A. office at this time.

Workshop By Mail. Copies of "A Workshop by Mail"—Project #1 of the Food Administration Section last year with Doris Odle as Chairman—are still available from the A.D.A. office at 50 cents a copy (twenty-two mimeographed pages).

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News of Advertisers and Exhibitors

The *H. J. Heinz Company* has announced the incorporation into its four precooked cereals for infants of a new form of iron more readily digested and assimilated by babies. The cereals are: Heinz Pre-cooked Oatmeal, Pre-cooked Barley, Pre-cooked Rice, and Pre-cooked Cereal Food (the latter containing a mixture of wheat, oats, and corn).

American Can Company has recently released a film titled "The Miracle of the Can"—a 41-min., 16-mm. color motion picture story of the packaging revolution in the U. S. during the past half-century. This film is available for showing to business, civic, scholastic, industrial, and agricultural groups.

Banana pudding is the newest "baby" of *GerberProducts Co.'s* baby dessert line. The product, said to appeal to mothers because of the difficulty of making uniform custard at home, contains: banana purée, sugar, cornstarch, egg yolks, cream and whole milk powders, salt, and vanilla.

Revisions have been made in the *John Sexton & Co.* booklet on *Menus & Recipes—Type A School Feeding Program.* Prepared by Isabelle N. Peterson, Sexton Dietitian, the new booklet has been augmented with additional menus and recipes, and a set of evaluation and food cost charts for the school year have been added. The menus are planned to follow the pattern of the Type A lunch and provide one-third to one-half of the students' daily food essentials. Glossaries of culinary and sanitation terms are included, as well as tabular information on approximate servings in various size cans.

S. Blickman, Inc. has recently announced its 1953 line of Tri-Saver coffee urns. New construction features of this equipment include elimination of the usual filler cup from the body of the urn; use of only one liner tube, since the coffee gauge glass is connected with the coffee faucet; elimination of holes under faucets at the bottom of the urn body; detachable heads on coffee and water faucets; and new-type burners attached to the urn, for use where thermostats are furnished for gas heat. The new Tri-Saver line is available in a complete range of sizes and models—including single, two-, and three-piece batteries, twin, combination, and institution type urns. Capacities range from 3 to 80 gal. for each urn. Urns may be equipped for gas, steam, or electric heat.

The Starlac Division of *The Borden Company* is distributing a sixteen-page booklet titled "Southern Recipes Featuring Starlac." In it are included small-quantity recipes for six chowders and soups, three entrées, eight breads, seven desserts, cream gravy, and salad dressing. The recipes were developed under a grant made to the School of Home Economics, Woman's College, University of North Carolina.